

NEW ACURA NSX: THE WORKINGMAN'S HYPERCAR

CAR DRIVER

JANUARY 2016

INTELLIGENCE. INDEPENDENCE. IRREVERENCE.

10 BEST CARS FOR 2016

*HALF OF 'EM
START UNDER
\$30,000

AND ALL THE
HEAVYWEIGHTS
THAT DIDN'T
MAKE THE CUT



FEATURING:
THE PEOPLE, PLANTS,
AND PROVING GROUNDS
THAT MAKE THESE
CARS GREAT.

PLUS

HIGH-SPEED THEATER OF THE ABSURD

BMW X6 M VS. MERCEDES-AMG GLE63

NEW FIAT 124 SPIDER DISSECTED

THE SAFETY STORY OF THE ALL-NEW
2016 CHEVROLET MALIBU

AS TOLD BY THE PEOPLE WHO ENGINEERED IT.

We sat down with active safety expert Raymond Kiefer and engineering safety specialist MaryAnn Beebe to talk about the innovation that went into creating the available active safety technologies in the all-new 2016 Malibu.





RAYMOND KIEFER

STAFF TECHNICAL FELLOW, ACTIVE SAFETY

What are some of the advanced active safety features engineered into the all-new 2016 Malibu?

Malibu offers a sophisticated range of radar, camera and ultrasonic crash-avoidance technologies to help drivers avoid crashes in everyday driving situations. In fact, we've engineered a number of available safety features, including Low Speed Front Automatic Braking, Lane Keep Assist with Lane Departure Warning and Rear Cross Traffic Alert. Before you make a lane change, the available Side Blind Zone Alert with Lane Change Alert feature lights up a side mirror icon if a vehicle is rapidly approaching or in your blind spot. Available Front Pedestrian Braking marks Chevrolet's first foray into helping drivers avoid pedestrians. An amber icon appears if a pedestrian is detected ahead and, if you're seconds away from a crash, red LED alerts flash on the windshield along with rapid beeping. If braking is delayed or if a pedestrian suddenly appears, the brakes are

automatically applied. This may not prevent the crash, but reducing crash impact speeds can make a real difference.

What's the difference between radar and camera technologies in active safety features?

Both technologies do an outstanding job of helping drivers increase awareness of what's going on around them. Radar is an active safety technology that improves vehicle detection range and works better in inclement weather conditions that may be a challenge for cameras. Camera technology works more like the way we see and avoid objects every day by using visual looming cues about the way objects grow in size as we approach. This technology is used in the available Low Speed Front Automatic Braking and available Front Pedestrian Braking features. Cameras can also show you hazards that you can't see directly with your eyes or mirrors.

“Teen Driver is a tool for parents to continue to teach safe driving habits to their young drivers.”

MaryAnn Beebe

ENGINEERING SPECIALIST, TEEN DRIVER



MARYANN BEEBE

ENGINEERING SPECIALIST, TEEN DRIVER

What is the Teen Driver¹ technology and how does it work?

Teen Driver is a tool for parents to continue to teach safe driving habits to their young drivers. It is a new feature that lets parents manage certain vehicle settings to encourage safer driving by their teenagers. Parents can set a volume limit for the radio and set a speed warning that will deliver an audible and visual warning when the vehicle exceeds the preset speed. When Teen Driver is active, the radio is muted if the driver or front passenger is not wearing a safety belt, and all equipped active safety systems are defaulted to “on.” Our goal was to use technology to help teens develop safe habits and, ultimately, be safer on the road.

How does the in-vehicle report feature work with other active safety features?

The Teen Driver in-vehicle report feature provides a snapshot of a teen's driving behavior. A parent can enter their Teen Driver PIN, and the report shows distance driven, maximum speed, number of over-speed warnings and how many times certain active safety features were engaged. For example, if the vehicle is equipped with available Forward Collision Alert or available Front Automatic Braking, the in-vehicle report will show how often these safety features were triggered. The in-vehicle report empowers teen drivers to show they've been driving responsibly, or see what driving skills they need to work on, and parents can continue to coach their new drivers. As a mom myself, it's rewarding to know that we're helping make a tangible difference. We want to set the industry standard for safety.



Safety features are no substitute for the driver's responsibility to operate the vehicle in a safe manner. The driver should remain attentive to traffic, surroundings and road conditions at all times. Read the vehicle Owner's Manual for more important safety information.

¹ Currently available on 2016 Malibu LT, Hybrid and Premier with the available 8-inch diagonal Chevrolet MyLink display.



IS F SPORT



GS F SPORT



RC F SPORT



EVERY RIDE A THRILL RIDE. The Lexus RC, IS and new GS.

Can a grocery run get your heart pumping? Can picking up the dry cleaning pick you up as well? Can the drive to your morning coffee be what gets you buzzing? It can and it will with the Lexus performance line. With its unique blend of power and precision, you can turn even the most everyday trips into drives for the ages. From RWD to AWD, from turbocharged to V6, with horsepower ranging from 241* to 311*, each model now boasts more engine variants than ever before. Because when it comes to performance, more choices mean more thrills.



lexus.com/performance | #Lexus

CAR AND DRIVER MAGAZINE ■ vol. 61, no. 7

in this issue

003

01.2016

045

MAJOR AWARDS 10BEST CARS

We go to the plants and proving grounds to find the people who make the cars we love for '16.
by The Editors

▼ FEATURES

082

FIRST DRIVE 2017 ACURA NSX

This new android samurai quietly destroys tracks.

by Aaron Robinson

088

COMPARISON TEST THE TALE OF THE TWO TOWERS

BMW X6 M vs.
Mercedes-AMG
GLE63 S Coupe.

by Daniel Pund

094

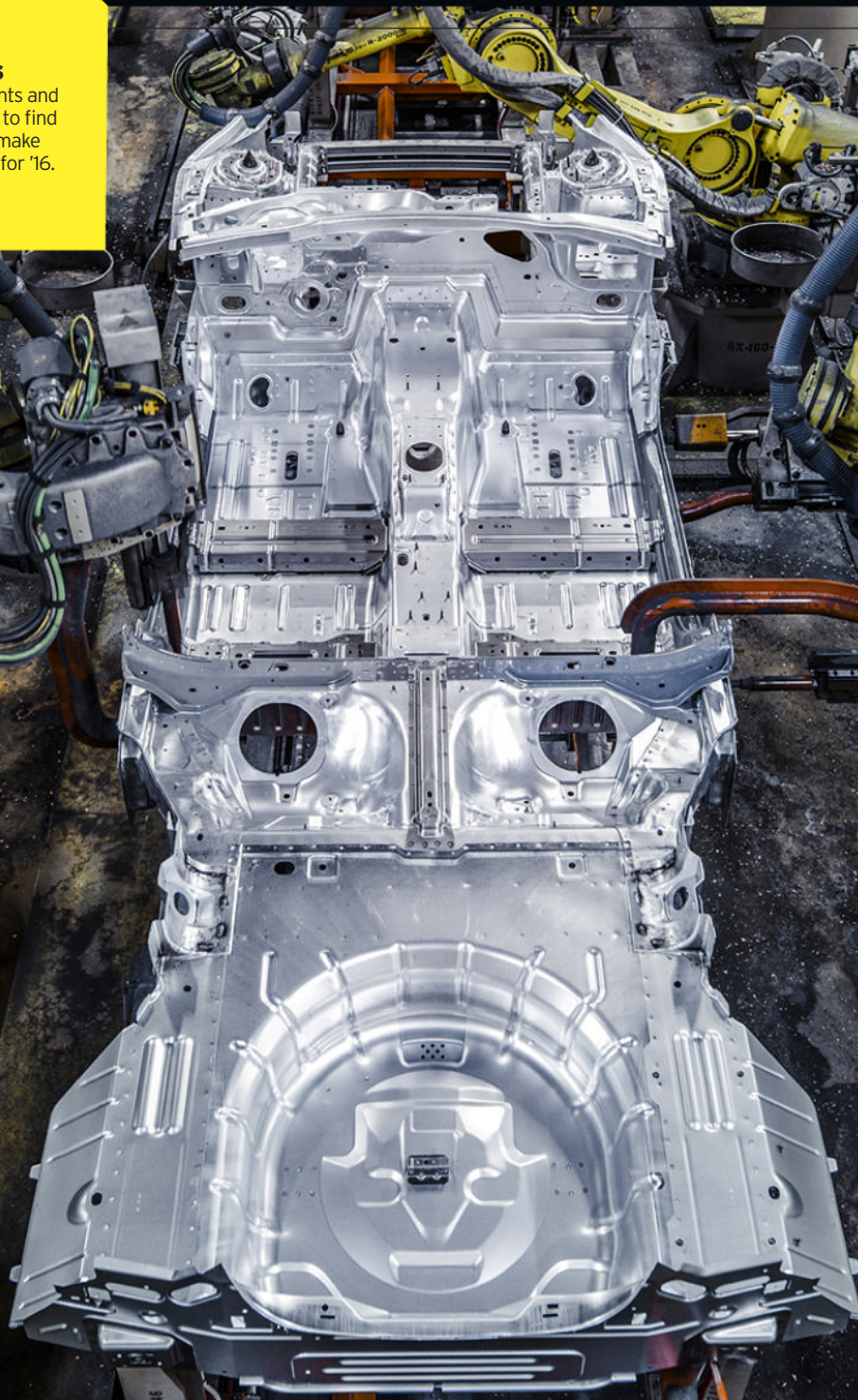
FEATURE WINNERS & LOSERS

Some who won, some who lost, and a few who should shut their NO_x traps.

by Aaron Robinson

ON THE COVER

Best cars do indeed look best in red.
photography by John Roe



WeatherTech®

Automotive Accessories



**SPORTS CAR RACING
DONE RIGHT!**

Accessories Available for

Acura · Audi · BMW · Buick · Cadillac · Chevrolet · Chrysler · Dodge · Ferrari · Ford · GMC · Honda · Hummer · Hyundai · Infiniti · Isuzu · Jeep · Kia · Land Rover · Lexus · Lincoln · Maserati · Mazda · Mercedes-Benz · Mercury · Mini · Mitsubishi · Nissan · Oldsmobile · Plymouth · Pontiac · Porsche · Saab · Saturn · Scion · Subaru · Suzuki · Toyota · Volkswagen · Volvo · and more!



At WeatherTech®, we take endurance racing as seriously as we take automotive accessories.

Order Now: 800-441-6287



American Customers
WeatherTech.com



Canadian Customers
WeatherTech.ca



European Customers
WeatherTechEurope.com

© 2015 by MacNeil IP LLC

006

01.2016

caranddriver.com

. in this issue



023



104



112

▼ COLUMNS

010

EDDIE ALTERMAN

The Also-Rans.

038

JOHN PHILLIPS

We sometimes disagree.

040

AARON ROBINSON

Has Tesla sunk itself with the Model X?

042

EZRA DYER

A stump-puller turns tree-hugger.

▼ UPFRONT

023

REVEAL OF THE MONTH

2017 FIAT 124 SPIDER

The Italian classic returns atop Mazda Miata bones.

026

INFOGRAPHIC

AGE OF CONSENT

Charting the longevity of automotive nameplates.

028

TEAM AMERICA

I WANT MY JLTV

The military appoints a successor to the long-serving Humvee—in very military fashion.

030

PHONING IT IN

CALLER ID

Iowa puts drivers' licenses on smartphones. Fun ensues.

036

NEW RULES OF CAR BUYING

SELLING GENIUSES

The dealership of the future may resemble an Apple Store.

▼ DRIVELINES

104

TESTED CHEVROLET MALIBU PREMIER

This stalwart mid-size sedan is most definitely back in the hunt.

106

McLAREN 570S

Now you, too, can afford a supercar!

108

TESTED MERCEDES-BENZ C450 AMG

Prime real estate between M-B and AMG.

110

LEXUS GS F

Attention sports-sedan shoppers: Don't miss the fresh meat in aisle three.

112

FERRARI 488 SPIDER

Top goes down. Looks good. Goes fast.

▼ ETC.

009

BACKFIRES

The Hellcat's gone AWOL, vans get their due, and battleship hoods shiver like gaffed tuna.

116

WHAT I'D DO DIFFERENTLY

Judy Stropus.

▼ ON THE WEB

INSTRUMENTED TEST

2016 CHEVROLET CAMARO V-6 MANUAL

Conceding two cylinders has never felt better.

[CARandDRIVER.com/2016CamaroV6Test](#)

INSTRUMENTED TEST

2016 HONDA ACCORD COUPE V-6 MANUAL

The best case for front-drive coupes.

[CARandDRIVER.com/2016AccordCoupeV6](#)

PICK-EM-UPS

A VISUAL HISTORY OF JEEP PICKUPS

The lineage is longer than you think.

[CARandDRIVER.com/JeepPickups](#)

EXCEPTIONAL CONCEPTUAL

THE GREATEST CONCEPT CARS OF ALL TIME, VOL. 1

A selection of autodom's most alluring flights of fancy.

[CARandDRIVER.com/GreatConceptsPart1](#)

10Best

CAR AND DRIVER
2016

SHELBY®

GT350R



Go Further

Shelby is a registered trademark of Carroll Hall Shelby Trust.

The *Pulse* of Performance™



Rapture Challenger
Downforce Motorsports



Specially formulated to keep high-performance engines cool and clean.

Trust the name that has become a legend in synthetic motor oil technology. AMSOIL delivers the power and performance you demand.

Formulated, blended and packaged in the USA.

AMSOIL
The First in Synthetics®

www.amsoil.com/auto

1-800-777-8491

Call or go online for our FREE
Factory Direct Retail Catalog



All trademarks names and images are the property of their respective owners and may be registered marks in some countries. No affiliation or endorsement claim, express or implied, is made by their use. All products advertised here are AMSOIL-engineered for use in the applications shown.

backfires

□ hosted by E.D.

009
01.2016

Sic your dogs on us at:
editors@caranddriver.com
or join the discussion at:
backfires.caranddriver.com



LAPLANDERS

I just finished reading the Lightning Lap issue [October 2015] and was surprised that there was no Dodge SRT Hellcat present. This has got to be one of the most hyped cars in recent memory. The preface says the car was a dropout but doesn't explain why. Having just taken delivery of a Challenger Hellcat after a 10-month wait, I'm curious what dropout means. So why no Hellcat?

JIM VANN
KANAB, UTAH

Dodge chickened out at the last minute and pulled the Challenger Hellcat that we'd scheduled. The official line sounded something like this, "We want all track media to concentrate on the Viper ACR"—Ed.

Over the years, all the car magazines have made icons of the European imports. In Lightning Lap, you kept the Dodge Viper and Dodge Hellcat out of the news. Are you afraid that these icons would destroy the imports? Get with it. American muscle deserves.

ART WITKOWSKI
SEATTLE, WASHINGTON

We tested a Viper TA in 2014. The new ACR didn't launch until after our test, and Dodge itself kept the iconic Hellcat out of the news (see above)—Ed.

Excluding the Dodge Challenger/Charger Hellcat from your Lightning Lap competition is unforgivable!

JOHN BICKLE
CAVE CREEK, ARIZONA

Do you ever wonder what your life would be like if your parents had named you Travis?—Ed.

The "Lightning Lap" article made another jab at the Ford Mustang

EcoBoost, referring to some of the horsepower in the Mustang being left at the glue factory. I know where you guys think you are going with this "glue factory" stuff, but it won't work with me as I own a 2015 Mustang EcoBoost, and it is everything I have ever wanted. It is zippy, quick, and gets 33 mpg on the highway. When I want to leave traffic behind I hit the EcoBoost, and zing! I leave everyone in the dust.

As we say in Texas. "My standard Mustang is a peachy-keen jim-dandy!"

VIRGIL GOULD
LAKEWAY, TEXAS

Didn't think you could say that in Texas—Ed.

I really enjoy Lightning Lap. A couple of suggestions: Can you always specify each car's transmission and tires? I am also very skeptical about cars that test on the Michelin Pilot Sport Cups. They're not really street tires. If you want to run them, run them on all of the top "LL" cars for a bit of equality. Regardless, the Vette was smokin' fast.

CRAIG BROWN
CHEVY CHASE, MARYLAND

Pilot Sport Cup 2s are definitely street-legal tires used on a number of performance cars; we test cars as they come from the manufacturer. We usually mention the transmission in the text, but we'll find a place for that information next year. Probably—Ed.

How embarrassing for the McLaren and the Lambo to show up for the big day at Lightning Lap wearing the same mutant-green frock!

BRYAN LAVIOLETTE
HOWELL, MICHIGAN

A year ago I wrote to you of my disappointment at the lack of a McLaren in the Lightning Lap. Aren't you glad you listened to me? My newly arrived October issue justifies my faith in the Wizards of Woking, and since I can't be reconciled with the Vette's looks, the 650S is now at the top of my "When I Win the Lottery" list. Sorry, Ferrari and Lamborghini!

DAVID SCOTT
DELAND, FLORIDA

I have a master of science degree and kept my old physics and calculus textbooks. Imagine my delight when, after all these years, I got to dig them out to help me interpret the graphs and charts from the Lightning Lap article. Finally, I got some vindication for hoarding old textbooks and for buying a new Corvette earlier this year. You helped me prove my wife wrong on two things within the same article. Bravo.

KYLE M. SMITH
PEORIA, ILLINOIS

Really, guys? You couldn't, or wouldn't, round up one BMW for your latest



Lightning Lap? I guess all the blowhard crybabies, who are sick and tired of reading about Bavaria's best, finally have got you by the *cajones*.

MATT CLYNE

OCEANSIDE, CALIFORNIA

It's cojones, Clyne. Unless you think they've got us by the dresser drawers—Ed.

I have a friend who owns a 2011 Mustang V-6 manual with the only option being the Performance package. I believe he purchased this car new for around \$28,000. It did a 3:12.5 lap time in the 2011 Lightning Lap. In this year's Lightning Lap you had a 2015 Mustang with the four-cylinder turbo, and its as-tested price was \$38,660, and it did a 3:15.6 lap time. Hmmm, \$10,000 more to go three seconds *slower* around VIR, and I have read that it doesn't even get better mileage than the V-6 in the real world. *Why would anyone buy this car?!*

RICHARD KEESING

MOORPARK, CALIFORNIA

Because it's a peachy-keen jim-dandy, Keesing—Ed.

TAKEN TO SCHOOL

Well, I finally managed to grind my way through Davey G. Johnson's hilariously overwritten Porsche Boxster Spyder review [Drivelines, October 2015]. Now I feel like an idiot. I had to Google words and references like "flibbertigibbet," "lesser bilby," and some other probably-made-up word describing the gearbox. At its \$83,000 price, I also can't afford the aforementioned Boxster Spyder. So that leaves me stupid *and* poor. Maybe some liberal democrat will help me out of that predicament.

BRYAN BELL

HAVERTOWN, PENNSYLVANIA

Whoa, whoa, Bell. Cool it with the political commentary. This is a car magazine—Ed.

ELECTRIFYING READERS

Your review of the 2016 Chevy Volt loses it value when you consider the insults on the first edition ["Utility Player," October 2015]. Since it has the highest rating from owners and is a quick, efficient, and comfortable vehicle with lots of positive comments on its looks, I have to wonder if the writer has any idea

. editor's letter

Every year we pick our 10Best cars, and every year we leave four to five times that many off the list. Usually, there is a vast gulf between the winners and the losers. But not this time.

There was a thick boundary layer of excellence at this year's base camp. Scores on my 10Best ballot only went as low as 72 out of 100. There were a lot of 90- and 92-point cars that didn't win, cars that didn't quite meet our guiding criteria, which is: *Can we name another vehicle on the market that does what this one does but better and cheaper? If so, it's not getting invited to the big photo shoot.* What we wind up with are cars that combine astonishing dynamics with compelling value and a clear sense of purpose, but that are rarely the most popular vehicles in their segments. We're fine with that. Anyone can look at a sales chart and pronounce the Bontoke GLT a winner. It's our job to unearth gems. Cars on the 10Best list should have your neighbors asking questions, sometimes relating to your sanity. Issues of personal taste, social conformity, and other base impulses rarely factor in. Except here, where to the chagrin of my co-workers, I get to wax on about favorite cars that didn't make the list. Here are this year's also-rans:

CADILLAC ATS-V SEDAN AND COUPE

Incredible machines, these. Powerful, composed, knife-edged. But what torpedoed the ATS-Vs was, oddly enough, the Camaro. It has the V-8 the ATS-V doesn't, and the assassin's chassis it does. The Chevy was simply more fun at reasonable road speeds than the Cadillac, which seemed almost too planted, too grippy, too disinclined to lean or roll or flow. It was like a GT3 racer with an infotainment system. A staggering achievement that left too many of us cold.

HONDA CIVIC

After looking at this car's spec sheet, Jeff Sabatini said: "Hmm. It's got a 1.5-liter four and a CVT. So it'll be like a Porsche 930 Turbo except instead of punching you in the face, it'll be a fly landing on your nose." Not so fast, ye of the erstwhile ponytail. Honda, through its miraculous vehicle integration, makes the Civic's hardware work. It is lithe, fun, reliable, and roomy. But alas, it's no Golf.

MERCEDES-BENZ C450 AMG

Benz-slappy that I am, I find it hard to do one of these yearly columns without including one Mercedes. So here it is—the sweet spot between the country-clubbing C300 and the seal-clubbing C63. I'd buy one.



Eddie Alterman

EDITOR-IN-CHIEF



what he is talking about. I'm sure the 2016 will be better, but the 2013 is an excellent car.

TOM GOOLD

VANCOUVER, WASHINGTON

Robinson criticized, he didn't insult, the previous Volt's instrument panel and controls. Perhaps you forgot that we named the Volt to our 10Best list in 2011—Ed.

Chevy is to be congratulated on the improved styling of the new Volt. However, the upper-grille opening appears to have been taken from an Acura. Can GM expect to be sued or thanked by Acura for broadening the use of its design, which has been derided as a vegetable slicer in the past?

KEN HEDGER

CAMBRIDGE, ONTARIO

BIG TUNA

After reading "the battleship hood shivered like a gaffed tuna," something snapped ["Night at the Museum," October 2015]. I might not take a bullet for John Phillips, but I would surely smack someone in the face with a trout if he directed me to. The writing and personalities in your magazine have always fueled my interest in cars as much as the beasts themselves. Please keep huffing the good stuff, you maniacs.

VINCE SZOPA

SEATTLE, WASHINGTON

THE BUYING GAME

I read with interest Cobb and Mayersohn's article ["Let's (Still) Make a Deal," October 2015]. I have to disagree that car manufacturers are figuring out how to leverage the internet. There is nothing special about FordDirect.com. It's nothing more than a shortcut to the "build my own" function of Ford.com. The quality of "Build Your Own" varies widely between brands. And internet commerce, especially of the "build your own" variety, typically results in a sale. Except with cars. With cars, it results in a: "Yeah, we can't find anything exactly like what you really want, so tough luck. Here's something else you could settle for, though."

That "settling" is a byproduct of the






#STOPDREAMING #STARTRACING

COME RACE WITH US

- NEW ARRIVE-AND-DRIVE series accessible to all.
- Sprint and endurance races from \$4,990.
- Introduction to racing program at \$1,990.
- Racing School and testing all year round.
- Available in Las Vegas and Los Angeles.



BOOK YOUR RACING EXPERIENCE NOW

(702) 802-5644 OR EXRSERIES.COM

EXOTICS RACING®

THE ULTIMATE DRIVING EXPERIENCE







DRIVE EXOTIC CARS ON A RACETRACK

IN LAS VEGAS AND LOS ANGELES

 LAMBORGHINI AVENTADOR \$499 / 5 LAPS	 LAMBORGHINI HURACÁN \$399 / 5 LAPS	 AUDI R8 V10 PLUS \$249 / 5 LAPS
 FERRARI 458 ITALIA \$399 / 5 LAPS	 PORSCHE 991 GT3 \$299 / 5 LAPS	 MERCEDES-AMG GT S \$299 / 5 LAPS

BOOK YOUR DRIVING EXPERIENCE TODAY

(702) 802-5672 OR EXOTICSRACING.COM

ALL-NEW JAGUAR XF

THIS IS NOT BUSINESS AS USUAL



Introducing the all-new Jaguar XF.

Built from lightweight aluminum and equipped with a supercharged 380 hp V6 engine, the XF is powerful, agile and uncommonly quick. Coupled with leading edge technology, it delivers a unique and intuitive driving experience. And now, all new Jaguar vehicles are backed by Best-In-Class Jaguar EliteCare, our exceptional 5 years or 60,000 mile coverage including complimentary scheduled maintenance.*

You'll find that the 2016 XF is anything but expected.

JAGUARUSA.COM

THE ART OF PERFORMANCE

2016 Jaguar XF S vehicle shown. *Class is cars sold by luxury automobile brands and claim is based on total package of warranty, maintenance and other coverage programs. For complete



JAGUAR ELITECARE

5 YEARS 60,000 MILES

- | | |
|---------------------------------|---------------------------------------|
| 🛡️ New Vehicle Limited Warranty | 📍 Complimentary Scheduled Maintenance |
| 🚑 24-Hour Roadside Assistance | 📶 Jaguar InControl® Remote & Protect™ |

BEST IN CLASS COVERAGE

014
01.2016

. backfires

dealership-franchise business model. I strongly disagree that dealerships are necessary at all anymore. “Serviceships?” Definitely. But dealers are innately inflexible and not interested in providing buyers with what they want. They’re interested, instead, in selling what they have in stock. How they determined what to have in stock is a matter of luck or actuarial science, not a desire to meet specific customer needs. And the sales experience itself? Why does it take 45 minutes to work up a quote? Why does every question result in the salesman walking away for 15 minutes to “check with my manager”? The entire process is designed to frustrate and confound, to mislead and subdue.

MICHAEL A. MEYSTEL

PHILADELPHIA, PENNSYLVANIA

Know what I hate? Why is it that you have to enter a ZIP code to build a Chevy Sonic, but every adult site on the internet knows exactly where you are?—Ed.

There is a simple solution. Go to a broker. We have for the last eight or nine cars. Do all the internet searches you like, but pick your car, pick your price, and call a broker. Leaves those sh##heads at the dealer in the cold.

I’m sorry, can I say sh##heads in C/D?

KEN MORGAN

FOUNTAIN VALLEY, CALIFORNIA

Beats the sh#t out of me—Ed.

VAN GO

I’ve observed that roughly 70 percent of your magazine is devoted to Chevrolet Corvettes (I made that up). The rest is filled with stupid, busy graphics that keep me from really digging into most of the issues. Consequently, I had it in my head that C/D was deteriorating from a great magazine to something else entirely. But

after forcing myself to allocate a bit of time to properly consume the October 2015 issue, I now realize I was wrong. From the great analysis done in the huge Lightning Lap piece to the van-tastic article on van-ology [“The 2% Solution”], you guys are still all over it. Drive on!

CURT ALBERT

SEATTLE, WASHINGTON

VAN PROS

In the van test [“Schlep Rock,” October 2015], how did you guys actually find a winner in the “exterior styling” category? Picking between those three is kind of like deciding which one of Marge Simpson’s sisters turns your crank the most.

BRUCE HINES

TORONTO, ONTARIO

Team Selma—Ed.

GEE. NO, GLC

I have to admit I kind of chuckled amid fond memories when I saw that the

Mercedes-Benz GLK will now be called the GLC. I take it Mazda didn’t maintain the rights to that name? My first car was a bright-yellow 1980 Mazda GLC that I paid for myself. That car was a stick shift, rear-wheel drive, and could do great hand-brake slides (providing no one was in the back seat), all for a mere \$1200. Definitely a “Great Little Car!”

MARK HARRISON

ELK GROVE, CALIFORNIA

GOING POSTAL

After reading all the wonderful comments about the July 2015 60th Anniversary issue, I wondered why I had not seen it since I am a subscriber! I think the mailman’s dog ate it.

ALLAN FEDOR

ASHEVILLE, NORTH CAROLINA

Oh, my God! I opened the October issue and started reading the Backfires and realized that I didn’t get my anniversary issue. I headed to the porcelain library and went through my stack of C/Ds to see if I missed it in the summer work craze. No! I then went and started my interrogation of all three suspects in this crime. No one had seen it! I dug through the boy’s room, knowing that he would be my first suspect, but turned up nothing. I solemnly walked back to my seat in my “library” and read all the great comments on how wonderful the anniversary issue was. As I left my favorite reading room

CAR AND DRIVER

EDITOR-IN-CHIEF Eddie Alterman

DEPUTY EDITOR Daniel Pund
EXECUTIVE EDITOR Aaron Robinson
MANAGING EDITOR Mike Fazioli
FEATURES EDITOR Jeff Sabatini
TECHNICAL EDITORS K.C. Colwell, Eric Tingwall
COPY CHIEF Carolyn Pavia-Rauchman
EDITOR, MONTANA DESK John Phillips
STAFF PHOTOGRAPHER Marc Urbano
EUROPEAN EDITOR Mike Duff
CAROLINAS EDITOR Ezra Dyer

CREATIVE DIRECTOR Darin Johnson
TECHNICAL DIRECTOR Don Sherman
DESIGN DIRECTOR Nathan Schroeder
SENIOR EDITORS Tony Quiroga, Jared Gall
ASSOCIATE MANAGING EDITOR Juli Burke
COPY EDITOR Jennifer Harrington
ASSOCIATE DESIGNER Jennifer Choi
OFFICE AND INVOICE MANAGER Susan Mathews
ROAD WARRIORS Zeb Sadiq, David Beard

CONTRIBUTING EDITORS
Clifford Atiyeh, Jethro Bovingdon, Csaba Csere,
Fred M.H. Gregory, John Pearley Huffman,
Davey G. Johnson, Peter Manso, Bruce McCall,
P.J. O'Rourke, Tony Swan, James Tate,
Basem Wasef, Kevin A. Wilson, Dweezil Zappa

CONTRIBUTING ARTISTS
Mark Bramley, Bryan Christie Design,
Jim Fets, Robert Kerian, Aaron Kiley,
James Lipman, Charlie Magee, Sean McCabe,
Chris Philpot, Roy Ritchie, John Roe,
Michael Simari

EDITORIAL OFFICE 1585 Eisenhower Place, Ann Arbor, Michigan 48108

PUBLISHED BY HEARST COMMUNICATIONS, INC.
PRINTED IN THE U.S.A.

EDITORIAL CONTRIBUTIONS Unsolicited artwork and manuscripts are not accepted, and publisher assumes no responsibility for return or safety of unsolicited artwork, photographs, or manuscripts. Query letters may be addressed to the deputy editor.



PEOPLE WHO KNOW ***CARS & ENGINES*** USE ROYAL PURPLE



Royal Purple's unique blend of additives, such as our proprietary Synerlec® technology, enable Royal Purple synthetic products to outperform leading synthetic and conventional lubricants.

Royal Purple—feel the difference!



www.royalpurple.com

ROYAL PURPLE™



**Innovation
that excites**

THE ALL-NEW NISSAN MAXIMA.®

Under the redesigned body is an exhilarating 300-horsepower V6 with GT-R®-inspired, sodium-filled valves. Inside the jet fighter-inspired cockpit you're treated to Premium Ascot leather-appointed seats with quilted Alcantara® inserts¹ and a sport mode that dials up the responsiveness of the engine and transmission, letting you choose just how hard-core of a dad you want to be.





LETTER OF THE MONTH

Tell Robinson: i-Sorry.

MATT MAIN

ANCHORAGE, ALASKA

and washed my hands, I wiped a tear from my face and raised my fist in the air. I yelled at the top of my lungs cursing that darn postman. Goodbye. This will be a long, cold winter without you.

MARTIN PAHKAMMAA

FAIRBANKS, ALASKA

I received my October issue of *Car and Driver* a few days ago, and, after reading all the comments in Backfires about the July issue, I realized that I never received it! I'm positive I would remember an issue that garnered so many comments. I have a sneaking suspicion that my anniversary issue now graces the coffee table of some postal worker who couldn't resist just reading it and passing it on to me.

JERRY L. PAGE

PADUCAH, KENTUCKY

All the praise you got in Backfires makes me wonder: Why didn't I receive my copy?

BOB NELSON

CALAIS, FRANCE

I have been a subscriber to *C/D* since the early '80s. Imagine my surprise and constipation as I was reading Backfires in the current issue and found out I had missed the greatest issue of all time. Somehow, during a recent move, I did not receive the July issue. I had all my mail forwarded to my new address, but I suspect the mail carrier in Edinburg, Texas, enjoyed the issue.

WILLIAM J. ODOM JR.

SEGUIN, TEXAS

I went to my mailbox and *holy mackerel!* I now have my July issue of *Car and Driver*. Now winter will be a little more tolerable. Thank you for sending it! It was either that or the mailman felt guilty for swiping it.

MARTIN PAHKAMMAA

FAIRBANKS, ALASKA

i-ROBINSON

Congratulations to Aaron Robinson for being man enough to buy an electric car, and a wimpy one at that ["We Bought a Space Aphid. Got a Plug We Can Use?" October 2015]! Well, I guess he did try to pawn it off as his wife's. Seriously, though. I thoroughly enjoy my Chevy Spark EV, and even after owning many performance/sports cars in my considerable years, I have to say it's as much fun to drive as any of the others. Also, as Robinson mentions, the cost of operation is amazingly low. Charging my electric car at night with an electricity rate of 10 cents a kWh, my energy cost is about 2 cents per mile. And there's been little maintenance. At nearly 100,000 miles I've only changed the cabin air filter and coolant fluids.

FRED J. GEIGER

SANTA CRUZ, CALIFORNIA

It's hard to read about Robinson buying the Mitsubishi i-MiEV not because of its greenness but because it was cheap, while in the same breath talking about maintaining a Lamborghini Espada!

RON CAMERON

WINOOSKI, VERMONT

SUBSCRIPTION SERVICE For fast and convenient subscription service, visit service.caranddriver.com to order a print subscription, pay your bill, renew your subscription, give a gift subscription, update your mailing and email addresses, and more! Or write to Customer Service Department, *Car and Driver*, P.O. Box 37870, Boone, Iowa 50037; or call toll-free: 800-289-9464. • **PERMISSIONS** Material in this publication may not be reproduced in any form without permission. • **REPRINTS** For information on reprints and e-reprints, please contact Brian Kolb at Wright's Reprints, 877-652-5295 or bkolb@wrightsreprints.com. • **BACK ISSUES** To order back issues dated within the past two years, please go to backissues.caranddriver.com. For digital back issues, please go to www.zinio.com/cd-issues. • *Car and Driver* © is a registered trademark of Hearst Communications, Inc. • Copyright 2015, Hearst Communications, Inc. All rights reserved.

See your dogs on us at: editors@caranddriver.com or join: backfires.caranddriver.com

CAR AND DRIVER

**PUBLISHER AND
CHIEF REVENUE OFFICER**
Felix DiFilippo

ASSOCIATE PUBLISHER Jason Nikic
EXECUTIVE DIRECTOR, GROUP MARKETING Lisa Boyars

EXECUTIVE DIRECTOR, DIGITAL ADVERTISING
Brian McFarland

New York
EAST COAST AUTOMOTIVE DIRECTOR Cameron Albergo
INTEGRATED SALES MANAGER Samantha Rady
EAST COAST DIGITAL SALES MANAGERS
Drew Osinski, Brett Fickler
ASSISTANT Vincent Carbone

Chicago
INTEGRATED SALES DIRECTOR Rick Bisbee
INTEGRATED SALES MANAGER Paul Truin
ASSISTANT Yvonne Villareal

Detroit
INTEGRATED SALES DIRECTOR Mark Fikany
ASSISTANT Toni Starrs

Los Angeles
INTEGRATED SALES DIRECTOR Anne Rethmeyer
INTEGRATION ASSOCIATE Michelle Nelson

San Francisco
MEDIACENTRIC, INC. Steve Thompson, William G. Smith

Dallas
PR 4.0 MEDIA Patty Rudolph

Hearst Direct Media
SALES MANAGER Elad Cettlinger
ACCOUNT MANAGER John Stankewitz

MARKETING SOLUTIONS
SENIOR MARKETING DIRECTOR Jason Graham
ASSOCIATE MARKETING DIRECTOR Amanda Luginbill
MARKETING MANAGER Michael Coopersmith
ASSOCIATE INTEGRATED MARKETING MANAGER Holly Mascaro
INTEGRATED MARKETING COORDINATOR Scott Topel
GROUP DIGITAL MARKETING DIRECTOR Kelley Gudahl
DIGITAL MARKETING MANAGER Anthony Fairall

CREATIVE SOLUTIONS
EXECUTIVE CREATIVE DIRECTOR, GROUP MARKETING
Jana Nesbitt Gale
ASSOCIATE ART DIRECTOR Michael B. Sarpy

ADMINISTRATION
ADVERTISING SERVICES DIRECTOR Regina Wall
ADVERTISING SERVICES COORDINATOR Rebecca Taron
ASSISTANT TO THE PUBLISHER Jeanette Silverstein

PRODUCTION
GROUP PRODUCTION DIRECTOR Chuck Lodato
GROUP PRODUCTION MANAGER Lynn Onyevan Scaglione
PREMEDIA MANAGER Frank Linzin

CIRCULATION
CONSUMER MARKETING DIRECTOR William Carter

HEARST MEN'S GROUP
SENIOR VICE PRESIDENT AND GROUP PUBLISHING DIRECTOR
Jack Essig
ASSOCIATE PUBLISHER AND GROUP MARKETING DIRECTOR
Jill Meenaghan
GENERAL MANAGER
Samantha Irwin
EXECUTIVE DIRECTOR, GROUP STRATEGY AND DEVELOPMENT
Dawn Shegobey
SENIOR FINANCIAL ANALYST
Naiohe Mayo

**PUBLISHED BY HEARST
COMMUNICATIONS, INC.**
PRESIDENT & CHIEF EXECUTIVE OFFICER
Steven R. Swartz

CHAIRMAN
William R.
Hearst III

**EXECUTIVE
VICE CHAIRMAN**
Frank A.
Bennack, Jr.

HEARST MAGAZINES DIVISION
PRESIDENT David Carey
PRESIDENT, MARKETING & PUBLISHING DIRECTOR
Michael A. Clinton
EDITORIAL DIRECTOR Ellen Levine
PUBLISHING CONSULTANTS Gilbert C. Maurer,
Mark F. Miller

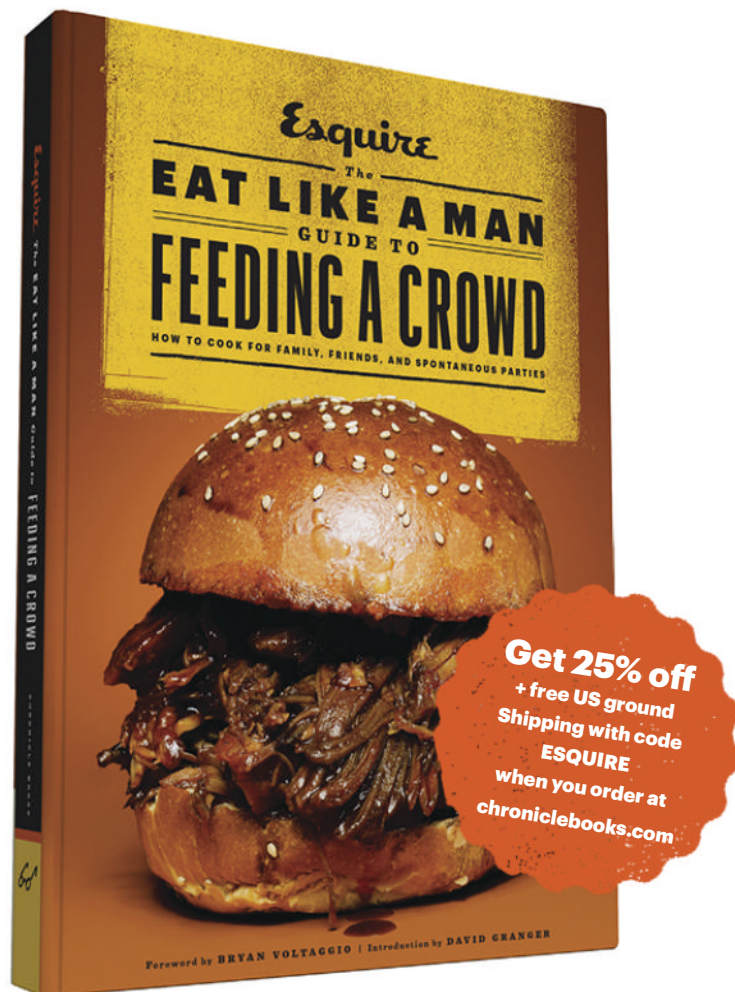
Shell
V-Power®
NITRO+
Premium Gasoline
The Official Fuel of
CAR AND DRIVER

Using Shell
V-Power® NITRO® +
Premium Gasolines
and diesel fuels
appropriately in all
Car and Driver test
vehicles ensures the
consistency and
integrity of our
instrumented
testing procedures
and numbers, both
in the magazine
and online.



The only cookbook you'll ever need when the party is at your place!

The ultimate resource for guys who want to host big crowds and need the scaled-up recipes, logistical advice, and mojo to pull it off. Whether they're cooking breakfast for a houseful of weekend guests, producing an apic spread for the playoffs, or planning a backyard BBQ. Includes more than 80 recipes, with favorites from chefs such as Tom Lolicchio, Mario Batali, and Bryan Voltaggio.



★ MERGER OF EQUALS

Sergio Marchionne has done the math on a merger between FCA and GM, and he says the combined entity would bring in \$30 billion in revenue annually. “Thirty,” he told Automotive News. “Just think about that [expletive] number.”

upfront

□ edited by JARED GALL

TWIN HOOD HUMPS,
JUST AS ON THE
ORIGINAL 124 SPIDER.



• REVEAL OF THE MONTH

Spidey Cents

FIAT'S 124 SPIDER RETURNS ATOP MAZDA MIATA BONES.
AND IT ONLY LOOKS EXPENSIVE. *by Csaba Csere*

FIAT CHRYSLER BOSS Sergio Marchionne has made no secret of his desire to hook up with another major automaker in pursuit of massive economies of scale. When General Motors CEO Mary Barra rebuffed his initial overture, he memorably (and creepily) quipped, “I can hug you nicely, I can hug you tightly, I can hug you like a bear.” While the new Fiat 124 Spider is the product of cooperation with another automaker, it’s a far cry from whatever sort of hug Marchionne has in mind.

■ STYLING

The 124 Spider springs from a

024

01.2016

caranddriver.com

. **upfront** . REVEAL OF THE MONTH

Most of us, if we took a nap for 35 or so years, would just wake up tired. The Fiat 124 Spider, on the other hand, returns improved and invigorated.

2017 Fiat 124 Spider/1969 Fiat 124 Spider

BASE PRICE: \$32,000*/\$21,000†

DISPLACEMENT: 1368 cc/1438 cc

POWER: 160 hp/96 hp‡

TORQUE: 184 lb-ft/83 lb-ft‡

WHEELBASE: 91.1 in/89.8 in

LENGTH: 159.5 in/156.3 in

WIDTH: 68.5 in/63.5 in

HEIGHT: 48.6 in/49.2 in

CURB WEIGHT: 2400 lb*/2093 lb

PERFORMANCE

ZERO TO 60 MPH: 6.0 sec*/10.1 sec

STANDING 1/4-MILE:

14.7 sec*/17.5 sec

TOP SPEED: 130 mph*/104 mph

*C/D estimated. †1969 pricing inflation-adjusted to 2015 dollars. ‡1969 power and torque are gross, not today's net, figures.

longer, stretching the 124 Spider five inches more than the Miata overall and giving it a slightly classier and less aggressive profile. Luggage capacity increases only 0.3 cubic foot (from 4.6 to 4.9), though, so your golf bag will still be riding shotgun. A prominent character line that starts behind the front wheel, kicks up near the door handle, and continues rearward mimics a similar line on the original Spider.

■ POWERTRAIN

Under the hood lies the 1.4-liter turbo-charged four-cylinder from Fiat's 500 Abarth, modified for longitudinal mounting. With 160 horsepower and 184 pound-feet of torque, it is up five ponies and 36 pound-feet—at 2050 fewer rpm—compared with the naturally aspirated 2.0-liter in its Mazda sibling. But its 6500-rpm redline is 300 revs lower than the Miata's.

AND THE THROWBACK
HITS KEEP COMING. THE
KICK-UP AT THE DOOR
HANDLE RECALLS THE
OLD NON-JAPANESE FIAT.



The engine is coupled to a six-speed manual that comes from the previous-generation MX-5, the taller gearing of which better matches the output of the turbo-charged four. The six-speed automatic is an Aisin unit, similar to the one that has been used in the MX-5 for several years. Those hoping for the much more powerful engine from the Alfa Romeo 4C will be disappointed that it doesn't fit. Besides, FCA wants to reserve Alfa engines for Alfas. Fiat isn't talking performance yet, but expect the 124 Spider to be very close to the Miata in straight-line speed. Its engine is slightly more powerful, but we're guessing it weighs at least 100 pounds more than the Mazda, given the additional sheetmetal, turbocharger, inter-cooler, and older, 15-pound-heavier gearbox.

■ CHASSIS

The running gear is very closely related to the Miata. The Spider has an additional brace

in the front subframe and uses its own suspension calibrations with different springs, shocks, anti-roll bars, and electrically assisted power steering, but you'll find the same control arms up front and the same multilinks out back. Even the bushings and tires are MX-5 carry-overs—a standard 195/50R-16 and an optional 205/45R-17, both summer tires.

This suspension will be common to the 124 Spider in all markets, but Enrico Genchi, the team leader for the 124 Spider program, declined to say whether the car would be sportier or more comfortable than the MX-5. He did say that it would have “a good level of comfort with very low body roll.” The

ANGLED TAILLIGHTS ARE A SLY NOD TO THE TIPPED-UP OUTER FENDERS OF THE ORIGINAL ROADSTER.



AGAIN WITH THE RETRO CUES: THE HEADLIGHTS ARE FAIRER IN TO SUGGEST THE OLD 124'S FRONT END.



↑ It's a Miata cabin, only more classy-like. Fiat used up its allotment of retro stuff on the exterior; the interior is straight-up Mazda.

latter characteristic definitely does not apply to the Miata. Mazda won't comment on the Fiat's performance and design, other than to confirm that it did, in fact, lead development of both vehicles.

■ INTERIOR

Inside, the 124 Spider looks like a Miata in nicer clothing. The seats' shape, bolstering, stitching patterns, and cloth upholstery are different. While the overall dashboard shape is the same, the upper part is covered with a soft-touch material, also used on the upper door panels. Extensive use of satin-chrome finish lends an upscale zing to all trim levels. The manual convertible top on all models has acoustic insulation and a nice inner liner, which Mazda provides only on the Grand Touring version of the Miata. Chrysler's Uconnect infotainment system isn't compatible with Mazda's hardware, so the 124 uses Mazda's user-friendly system with Fiat graphics.

■ HOW SOON?

The 124 Spider will start rolling off the assembly line at Mazda's Hiroshima, Japan, plant in the summer of 2016 as a 2017 model. It will initially come in two versions, Classico and Lusso. Production will start with 124 copies of the limited Prima Edizione, celebrating the 50th anniversary of the original 124 Spider. They'll be solely for the U.S. market, with special blue paint, badges, and a premium leather interior.

Fiat's intent seems to be to sell a more luxurious Miata though not necessarily a less sporty one, suggesting pricing a few grand higher. But the car is undeniably pretty, and we welcome any rear-drive roadster that won't break the bank. You might even say we embrace it.

026

01.2016

caranddriver.com

upfront

FAMILIARITY
QUANTIFIED

★ THE OLD WORLD

AVERAGE
NAMEPLATE
AGE BY
COUNTRY
OF ORIGIN
IN YEARS:

ENGLAND: 25.5

GERMANY: 15.2

SWEDEN: 8.8

JAPAN: 14.6

KOREA: 12.1

U.S.: 19.0

ITALY: 22.6

Age of
ConsentCHARTING THE LONGEVITY OF
AUTOMOTIVE NAMEPLATES. by Jared Gall

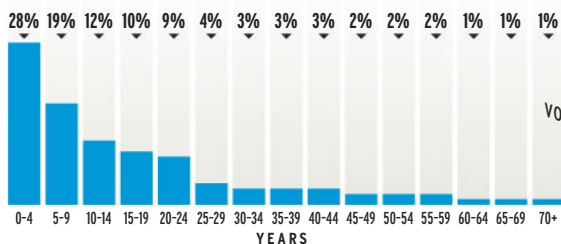
LAST YEAR WAS THE END of the line for the Mercedes-Benz M-class. There's no more GLK, either. Soon, the GL and the SLK will likewise disappear. Oh, the vehicles will still be around, but the badges are changing as Mercedes overhauls its naming convention. G-wagen aside, its SUVs are now GLs, keyed by size to the core C-, E-, and S-classes: The GLK is the GLC, the M is the GLE, and the GL will soon be the GLS. The SLK will become the SLC. Cadillac is about to make a similar change, and many in our office still use Infiniti's old names. "QX70? That's the FX, right?"

But automakers risk forfeiting individual models' brand equity in such scorched-earth renaming schemes. We tallied the age of every model on the market today to see who's clinging to the oldest names. Also to determine if value correlates to dotage and the recognizability that comes with it. In many cases, it seems, there's a premium associated with an old-money moniker.

OUR OWN
ARBITRARY RULES

Car names are often in use overseas prior to their arrival in the U.S. Nissan's GT-R is one such example. But while a select group of nerds—usually including us—might be aware of a car's existence abroad, we dated names to their debut on our shores and, to keep things simple, ignored any gaps in availability. In cases where a name first appeared as a trim level or option—such as Renegade, originally an option package on the Jeep CJ—we counted from the year it first appeared as a distinct model.

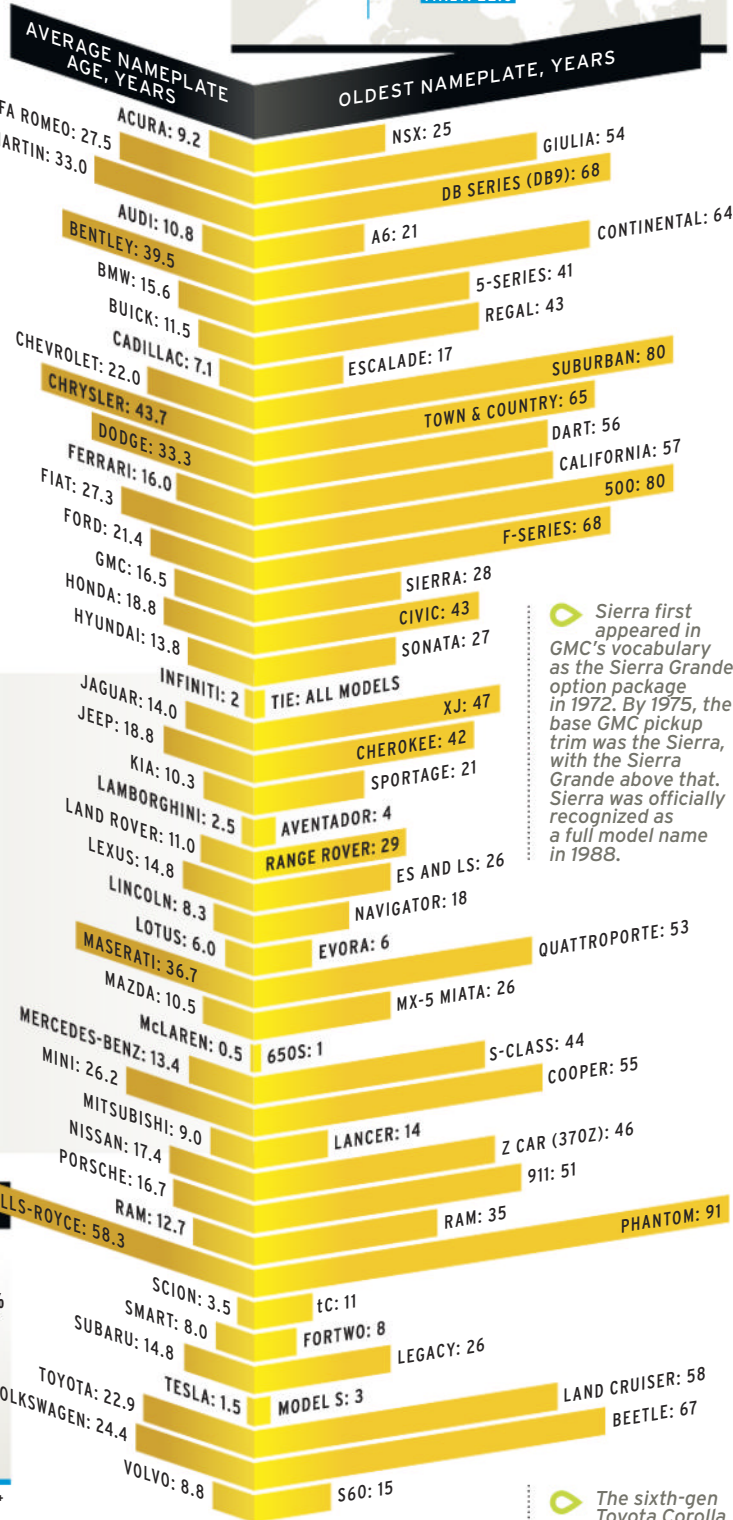
AGE DISTRIBUTION OF NAMEPLATES:



➤ Ford's first Mustangs are commonly referred to as model-year "1964 1/2," but check the VIN (or the title or any other official record of the car). The first Mustangs are all officially 1965 models.

➤ Years before the Odyssey and Pilot were prosaic Honda family haulers, they were insane off-road go-karts. The Odyssey made its debut in 1977 with a 250-cc two-stroke, upgraded to 350 cc in 1985, and was succeeded by the 400-cc Pilot in 1989. The Odyssey became a minivan for 1995 and the Pilot a crossover for 2003.

➤ The sixth-gen Toyota Corolla (1987-1992) was known internally as the E90, preceding the E90 BMW 3-series (2006-2013) by about a decade.



POWER TRAINED



With a substantial 279-horsepower engine and Variable Cylinder Management™ to help maximize fuel efficiency,* the 2016 Acura RDX gives you performance that's exhilarating and responsible. Hit the start button, and you'll see how much more satisfying power is when it's smartly used.



THE 2016

RDX

DRIVE LIKE A BOSS

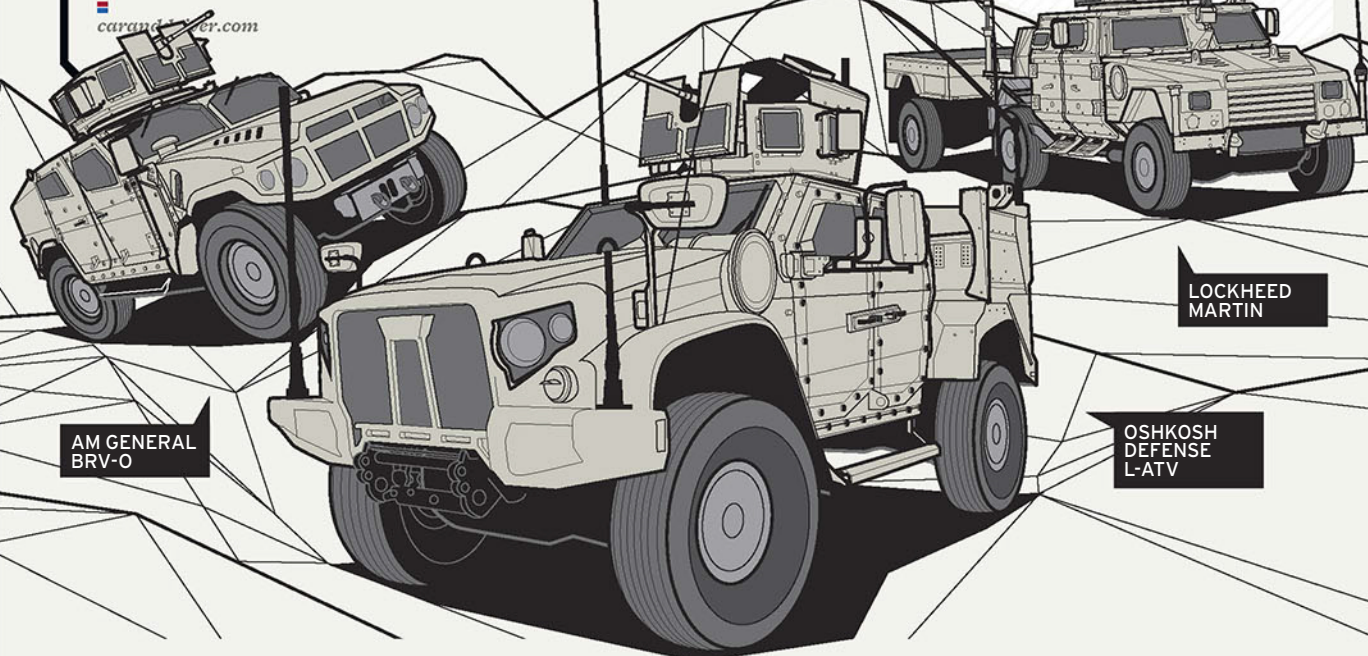
RDX with Advance Package shown. *20 city/29 highway/23 combined mpg rating for RDX FWD model. Based on 2016 EPA mileage ratings. Use for comparison purposes only. Your actual mileage will vary depending on how you drive and maintain your vehicle. ©2015 Acura. Acura, RDX, and the stylized "A" logo are registered trademarks of Honda Motor Co., Ltd.

028

01.2016

caranddriver.com

upfront . TEAM AMERICA

AM GENERAL
BRV-OLOCKHEED
MARTINOSHKOSH
DEFENSE
L-ATV

I Want My JLTV

THE MILITARY APPOINTS A SUCCESSOR TO THE LONG-SERVING HUMVEE—IN VERY MILITARY FASHION. *by James Tate*

AFTER A RUN OF 30 YEARS and nearly 300,000 vehicles, the Humvee has cemented its legacy as an icon of the post-Vietnam United States military. While it will continue in light-duty on-base roles, the realities of modern warfare require a new vehicle for combat missions, one that combines the versatility and agility of the Humvee with the protection offered by the heavily armored but much larger Mine-Resistant Ambush Protected (MRAP) vehicles also in service today.

The government sure took its sweet time deciding what that vehicle will look like. The selection process, known as the Joint Light Tactical Vehicle (JLTV) program, started in 2006; six different contractors and partnerships submitted proposals by '08. After delays, allegations of unfairness, and revisions to the vehicle parameters, the Army and Marine Corps in 2012 narrowed the search to three contenders: Oshkosh Defense, Lockheed Martin, and AM General, the Humvee builder. Each provided 22 prototypes for the ensuing evaluation phase, which concluded last summer.

Given Lockheed Martin's expertise building high-tech fighter jets, rather than ground vehicles, its JLTV was considered the high-risk, high-reward option. AM General's BRV-O (Blast Resistant Vehicle, Off-Road, but also "Bravo") represented the next evolution of the Humvee; not a great

leap forward, but a modern military vehicle deliverable on time and on budget. But military brass decided that the Light Combat Tactical All-Terrain Vehicle (L-ATV) from Wisconsin's Oshkosh had the right balance of tech and price tag and declared it the winner. The fact that the L-ATV shares many proven components and systems with the Oshkosh M-ATV already in service surely helped the company's case.

Compared with the Humvee, the L-ATV is larger, although the company declined to say by how much. Available with either two or four seats, the L-ATV is designed to be easily reconfigured in the field for different missions. It has a 6.6-liter GM Duramax turbo-diesel V-8 under the hood, with a diesel-electric hybrid powertrain as an option. Oshkosh's TAK-4i independent suspension gives the L-ATV 20 inches of wheel travel, six more

★ BILLION WITH A "B"

\$30 billion

Total amount Oshkosh's JLTV contract is expected to be worth over the life of the L-ATV.

than the best Humvees. Oshkosh claims that the reinforced underbelly offers protection comparable to today's MRAPs.

Like the M-ATV, the L-ATV's turret-mounted weapons—everything from a machine gun to tube-launched missiles—can be fired remotely if the situation gets too hot to have a soldier or Marine physically peering down the sights. So-called situational-awareness systems include shot detection for locating enemy fire, long-range surveillance, and both visible-light and infrared cameras. Another bit the L-ATV borrows from its big brother is a jammer that blocks radio signals intended to detonate improvised explosive devices.

With a maximum weight of 15,639 pounds, the L-ATV can be carried in cargo planes or by helicopter. Deliveries are slated to begin in 2018. The initial run of 17,000 will come at a cost of \$6.7 billion, or around \$400,000 per unit. Over the next few decades, the Pentagon predicts it will order up to 55,000—as many as 55,000 of something, that is. Lockheed Martin has filed a protest over Oshkosh's win.

illustration by MARTIN LAKSMAN

30 DAY MONEY
BACK GUARANTEE

74% OFF
WITH YOUR
PROMO CODE

The Daniel Steiger
TUNGSTEN ECLIPSE

Men's Watch: \$199

Ladies Watch: \$199

Set Price: \$339

TIMES NEXT REVOLUTION

5 YEAR
MOVEMENT
WARRANTY

The properties of tungsten make this the perfect metal for watch making. A rating of between 8 and 9 on the Mohs scale of hardness, sitting just below Diamonds means it is extremely strong and scratch resistant. Tungsten is also able to take an extremely high polish giving it an attractive mirror like finish. A Yellow gold fused stainless steel case and link hold the entire creation together, whilst a precision quartz movement works silently away under a designer grey dial emblazoned with 4 of our flawless created Diamonds. Magnificent presentation case.

CALL NOW TOLL FREE 24/7 ON 1-877 550 9876

AND QUOTE PROMO CODE: **CD5DTU**

Or order online at www.timepiecesusa.com/cd5d and enter **CD5DTU**

74% OFF

SRP \$759.00

NOW ONLY
\$199
EACH

PLUS SHIPPING & HANDLING

(YOU SAVE \$560)

Caller ID

IOWA PUTS DRIVERS' LICENSES ON SMARTPHONES. FUN ENSUES. *by Jeff Sabatini*

IMAGINE YOU'VE JUST CAUGHT the flash of red lights in your rearview mirror. As you pull over, your smartphone sends an alert, requesting permission for the police officer to view your license on a mobile device. You scan your thumb for verification, and the cop approaches. She greets you by name and, as she looks over your vehicle, sends the citation you've just received to your phone. You can enter your plea and pay the fine right on your device, the officer says, before heading back to her cruiser.

This scenario is inching closer to reality. Last August, the Iowa Department of Transportation spent \$40,000 on a pilot program to outfit 15 state employees with a "mobile driver's license," or mDL. This iOS app displays a virtual license with a rotatable image of the driver's head (developers call it the "Harry Potter feature") after users take a selfie that is verified against their license photo on file. Mark Lowe, director of the Iowa DOT's Motor Vehicle Division, says the mDL program is the result of public interest in the technology, which could be offered to more Iowans this year.

Some proposed benefits seem obvious: Instant updates to addresses and driving records will shorten lines at the DMV, and eliminating physical licenses saves the state production costs. Also, merchants and financial institutions see it as a means of combating fraud. "We can provide more trust in transactions," says Lowe. "There may be a revenue stream from that."



10%

of all thefts and robberies in the U.S. involve a mobile device.

NOT JUST GIZMODO Smartphone theft is now an epidemic. An FCC report says that more than 1 million were stolen in 2013, while *Consumer Reports* puts the number as high as 3.1 million.

The driver's license is already the de facto standard for proving identity, so it follows that cash-strapped states would seek to monetize this service. A system in which businesses would use a license-reader app to verify a credit-card customer's identity might net the state a small transaction fee. Bars and restaurants could similarly deploy apps for age verification. Lowe says this could also increase privacy for consumers, who would no longer need to expose personal information printed on a physical license, choosing to share only their photo and proof of legal drinking age.

Widespread deployment of digital drivers' licenses raises various concerns, though. They extend from the mundane—dead phone batteries and poor cell service—to serious security and privacy issues, such as unwanted location tracking, identity theft via software vulnerabilities, and hacked biometric databases. MorphoTrust USA, a longtime licensing contractor and the mDL developer, points to its expertise in credentialing services as proof that what evolves from this pilot program will be trustworthy. The company already handles TSA PreCheck enrollment for the Department of Homeland Security, and it says using the technology would be optional. "There will always be a way for someone who elects not to use a mobile driver's license," says MorphoTrust vice president of state and local sales Jenny Openshaw. "Cards are not going away anytime soon."

Nor is interest in mDL technology. Several other states are considering it, and Delaware will be launching its pilot later this year. Now, smile for the camera.



DON'T LET THE HARRY POTTER ALLUSION FOOL YOU; AN mDL WON'T MAKE YOU A WIZARD.

PROMOTION

Promotions • Products • Experience

DRIVER'S SEAT



EXPERIENCE LIFE AT 130MPH WITH EXOTICS RACING

Feel the thrill and exhilaration of pushing one of over 50 exotic sports cars to its limit on a racetrack. Our two exclusive locations are conveniently located at Las Vegas Motor Speedway and the Auto Club Speedway (Fontana, CA). The excitement of a lifetime starts at just \$199 for 5 laps.

To learn more call us at (702) 405-7223
or visit www.exoticsracing.com.



SCIENTIFIC PROOF THAT TRUE LOVE CAN LAST

Our one carat DiamondAura® Everlasting Anniversary sterling silver ring fuses modern science and old-fashioned romance! Our exclusive lab-created stones burn with more fire than mined diamonds. Everlasting Anniversary Ring – Only \$59 + S&P.

Call (888) 201-7086 with offer code: EAR233-02
or visit www.stauer.com.

THE \$1,890,000 BATTERY CHARGER*

**Koenigsegg Regera included with purchase*

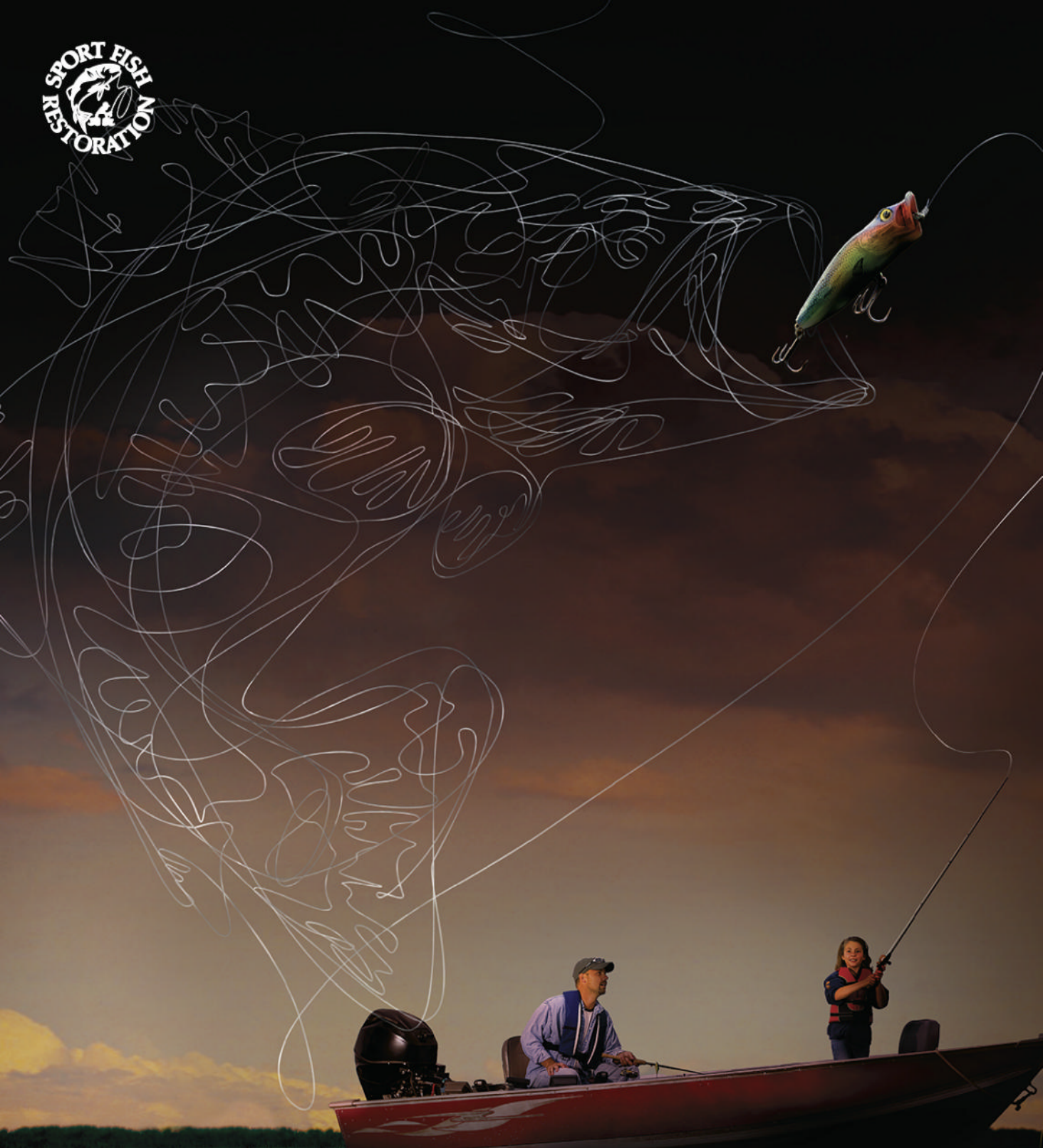
ALL BATTERY CHARGERS ARE NOT CREATED EQUAL

If technical performance and premium quality matter to you, Swedish CTEK chargers should be your first choice - and you will be in good company with almost every premium automotive manufacturer on the planet.

Read more about us at WWW.CTEK.COM



CTEK | MAXIMIZING
BATTERY
PERFORMANCE



THE SIMPLE ACT OF FISHING, PRESERVES FISHING.

Every time you purchase a fishing license or register your boat, a portion of the proceeds go toward preserving our nation's coastlines, lakes, rivers and streams. Protecting our memories on the water for generations to come.

Learn more at TakeMeFishing.org/Conservation



TAKE ME FISHING™

PROMOTION



GET INTO THE **DRIVER'S SEAT.** (FROM ANY SEAT!)

A **CAR AND DRIVER** TRICKED OUT DIGITAL SUBSCRIPTION CONNECTS YOU TO THE LATEST RIDES, GEAR & INDUSTRY NEWS ANYWHERE, ON ANY DEVICE, 24/7.

- > "TAKE" EVERY ROAD TEST & FIRST DRIVE FIRST—BEFORE THEY HIT NEWSSTANDS
- > GET IN ON AUDIO & VIDEO DIGITAL EXTRAS
- > ENJOY INTERACTIVE 360° VEHICLE VIEWS, SPEC SHEETS & MORE

WHAT'S HOT ON
THE ROAD...ON THE GO.



**TRY IT
ON YOUR TABLET TODAY AT
DEAL.CARANDDRIVER.COM**

PROMOTION

Promotions • Products • Experience

DRIVER'S SEAT



WOLVERINE® DRIVEN BY INGENUITY

Introducing Wolverine CarbonMAX®, the first safety toe using nanotechnology to create a combination of protection and lightweight comfort. Wolverine CarbonMAX workboots reduce strain on legs and feet, offer a better fit, and meet ASTM standards.

Visit www.wolverine.com
for more information.



K&N HIGH-FLOW AIR FILTERS

K&N High-Flow Air Filters are designed to increase horsepower and acceleration while providing excellent filtration. K&N replacement air filters are a quick and easy to install performance upgrade for most vehicles.

Call (800) 858-3333 or visit
www.knfilters.com for more information.



Selling Geniuses

THE FOURTH IN OUR FIVE-PART SERIES ON CAR COMMERCE SAYS: THE DEALERSHIP OF THE FUTURE MAY RESEMBLE AN APPLE STORE. *by James Cobb and Norman Mayersohn*

IF APPLE ENTERS THE AUTO BUSINESS, as some observers think is inevitable, it may not be its cars that matter. At least, not as much as the stores in which they are sold. The Apple Store ethos—seamless customer interaction, effortless problem solving, speedy service—has become the benchmark for retailers of all stripes. This customer experience is as integral to Apple's success as its elegantly simple product designs, compelling the company's faithful to line up to buy its new products.

That kind of sales environment has been unheard of in auto showrooms, where decades of hard-sell tactics and souk-style haggling have implanted resentment and distrust. Yet some visionary dealers are giving the Apple approach a shot, having concluded that it will take more than TV lounges and free doughnuts to win the business of tech-savvy customers in general and impatient millennials in particular.

Brad Miller is president of Miller-Nicholson, which owns Honda of Seattle and Toyota of Seattle, unusual conjoined dealerships that share a new six-story building off Interstate 5 near the city's sports stadiums. For Miller, the dealerships' move last spring offered an opportunity to blow up the old business model. What he has since created is nothing less than a laboratory to test a new way to sell cars. Miller says he didn't try to copy the Apple Store, though he is seeking a similarly satisfying customer experience.

The mantra is "One person, one price, one hour." That is, once a car has been selected, Miller says, "we should be able to get our guest onto the road within an hour, if that is what they want."

THAT KIND OF SALES ENVIRONMENT HAS BEEN UNHEARD OF IN AUTO SHOWROOMS, WHERE DECADES OF HARD-SELL TACTICS AND SOUK-STYLE HAGGLING HAVE IMPLANTED RESENTMENT AND DISTRUST.

New cars are sold at a fixed price with no spiffs on the side; don't even ask for free floor mats. The no-commission salespeople (only one has remained from before the move) guide a customer through the entire sales or lease process, including financing and other paperwork. The usual finance and insurance office—which sometimes twisted customers' arms to take the rust-proofing and an extended warranty, or marked up loan rates to pad the profit margin—has been banished. Financing terms now depend solely on credit scores.

Miller says early results are encouraging, despite a "hugely painful transition." His stores have been recruiting and training salespeople who don't have much, or any, car-dealership experience, but who have a "servant" mentality. Given the complexities of many transactions, including sales tax, insurance paperwork, and government regulations, there is a steep learning curve beyond the need to master product specs, options, and tech features.

Miller notes that one of the biggest challenges is countering customer skepticism, which is why he provides some free diagnostics in his service departments and is counting on positive buzz from customers on social media.

But even if Miller's Seattle experiment proves successful, can it be duplicated in markets where customers aren't as young, as affluent, or as tech-savvy? Analysts note that, with car sales booming, dealers are feeling little immediate pressure to change their ways.

Automakers, however, are looking ahead and floating their own showroom-level trial balloons. Toyota will soon roll out a limited test of no-haggle transactions at Lexus dealerships. Other automakers will focus on the dealership experience. Chevrolet has sent nearly 18,000 dealers and sales personnel to the Disney Institute for remedial hospitality workshops. BMW aims to ease the transition to its multilayered technology features for new owners by training 1000 product "geniuses," specialists who serve as advisers in dealerships, to tutor customers in the car's digital workings.

Whatever the magic formula may be, much depends on how it gets distilled. Referring to millennials, Miller says: "You have this unbelievably big buying segment coming up, and this huge disconnect, this huge distrust of the car-selling mentality. It is a collision of epic proportions. We really do have to get it right."

THE ALL-NEW TACOMA



**Let's
Go
Places**

SOME SEE AN OBSTACLE. OTHERS SEE A WEEKEND.

The all-new 2016 Tacoma elevates your epic adventures, thanks to first-in-class off-road technology. The Multi-terrain Select system in the TRD Off-Road features five driver-selected modes that help you take on tough terrain such as loose rock, mud or sand. The system regulates wheelspin by adjusting throttle and brake pressure to provide maximum traction and maximum fun. About the only thing Tacoma can't help you select is the best way to get back down.

Prototype shown with options. Production model may vary. ©2015 Toyota Motor Sales, U.S.A., Inc.

by John Phillips

WE SOMETIMES DISAGREE.



A fun thing about identity theft is that identity can't be stolen if it's not there to begin with. You could say that about a bunch of current automobiles, too, many evolving toward a kind of mute, amnesic homogeneity. I was thus delighted to find a silver Alfa Romeo 4C Spider at this year's 10Best test. A red coupe had vied for similar honors the year prior. I can't recall any car in 10Best history that has sparked more angst, joy, and raised voices. Last year, perhaps two-thirds of our editors slagged the Alfa for being so noisy, cramped, and nervous that it serves only as a one-hour Sunday-afternoon cruiser, where—among other denied pleasures—you won't be hearing the cheesy stereo or your passenger's pleas or oncoming BNSF locomotives. To be 10Best-worthy, a car must possess more

than one skill—as a commuter, perhaps, or as a people mover, or as a paradigm of mechanical reliability. The 4C hasn't interviewed for any of those jobs.

One editor tried to explain the car's failings thus: "Imagine if you made the sexiest broom in the world, bright red, carbon fiber, bristles made out of albino anteater fur. Cool, right? Except, at the end of the day, it's still just a broom." I walked away confused.

Like the vicious little snots in *Lord of the Flies*, C/D's editors ganged up on me, bollicking the Alfa's heavy steering, the almost religious devotion with which the front wheels follow the crown of the road, and the car's tendency to scare the oatmeal out of you when it suddenly—and it will be suddenly—surpasses its lateral grip and leads you by the nose into a cow pasture.

Of course, the same can be said of the first decade's worth of Porsche 911 Turbos, which we nonetheless loved more than Mother Teresa's skidpad.

I'm going out on a limb here, fully expecting my colleagues—apart from Aaron Robinson, who stands with me in the 4C's defense—to show up wielding chain saws. But when I lower myself into the Alfa's coffin of a cockpit, always bruising my left buttock on the huge carbon-fiber sill, I am more viscerally in touch with the driving experience than in any other car I can recall.

The 4C is like an involuntary reflex you can activate on demand. I'll be looking ahead and see a hairpin and say, "Oh, jeez, too fast," and the Alfa answers, "Yeah, well, we'll figure something out." I keep expecting to see part of the steering mechanism growing Terminator-like through my forearms. Plus, I'm never distracted in the Alfa because there's nothing to distract you except a lot of blurred landscape.

Robinson said, "The 4C is halfway between an Elise and a Boxster, leaning heavily toward the Elise." Then he

added, "It's like driving a Group B car [1981–92] with airbags." He's right about that. It's like driving a track car that is always on the track, which, come to think of it, describes last year's Chevy Camaro Z/28. Except the Camaro looks like a Camaro and the 4C looks like something one of the younger Pininfarinas contrived in a mescaline trance while tossing midgets in Enzo's office.

I am so charmed by the 4C Spider, so enchanted to become a human slice of cheese wedged into its grater of a seat, that I drove the thing, top lowered, 20 miles off our standard 10Best route in order to sample its freeway behavior. But before I got there, a black Ford Explorer in the oncoming lane made a dust storm of a U-turn, then pursued. Which is how I met Officer Vinson—at least I think that's what he said—who seemed amused to watch me wrestle with the registration and insurance cards, which were somehow glued into the hidden plastic sleeve that comprises the Alfa's absurd glove box. "This is a nice car," he declared, flashing a smile so earnest and engaging that I liked him instantly. "Well, I'm really having fun," I told him, because that's what the Alfa does to me. It puts me in an open and honest and relaxed frame of mind, and it makes life-long enemies kiss each others' hands. He asked if I knew how fast I was going.

"Seventy-two in a 55 zone," I said.

"We have a winner!" he cheered.

Officer Vinson had never seen an Alfa, had never heard of one. Eventually, the two of us more or less bonded in our tag-team

attempt to track the Alfa's manufacturer's plate. "It's coming up nothin'," he said over and over, flashing ever-bigger grins. I gave him the number of Chrysler's press office. Instead, he pointed at the gray hump of carbon fiber in the footwell and said, "Don't tell me that's the frame." I gave him a brief tour, then he waved me off, saying, "Okay then, might as well keep having fun." I departed with nary a dollar's damage to my allowance.

Of the 50 drives I undertook at 10Best this year, none was more memorable. When the Alfa and I returned to Test Central, a loitering editor said, "I'll bet you're happy to climb outta that thing."

I was tired of arguing. So I arranged to have him killed. ■



► The Alfa 4C Spider. It's a festival of endearing flaws.

Introducing the new V1

**V1 rarely changes on the outside.
Can you spot what's new? ***

NOW



Can you spot the difference?



► **ESP added to enable info sharing with auxiliary devices.**

Can you spot the difference? **



► **Longer range: warning distance increased on Ka-band.**

Can you spot the difference?



► **Laser warning redesigned to fit within original-height case.**

Can you spot the difference?



► **New LED display identifies each of four bands: X, K, Ka and laser.**

Can you spot the difference?



► **Front and rear laser-warning added; requires taller case.**

Can you spot the difference?



► **V1 debuts with radical new feature—the Radar Locator.**

1992

The first V1 detail you see—the Radar Locator:
It's a Valentine One invention. Where's the radar?
Or laser? A red arrow points to the source.

But you can't see "Continuous Improvement."
We don't do model changes. Instead, when we
have a new trick, it goes into V1 immediately.

All new components inside. Over the years, our
engineers have made 26 major performance revs
inside V1. In effect, they've changed everything.
We want our customers to get our very best
ideas as soon as we can build them.

Our newest trick we call Junk-K Fighter. Like
most of V1's improvement, you can't see it. It's
a software algorithm that recognizes unthreat-
ening K-band alerts and preemptively excludes
them. You won't hear a thing. Our customers call
it a breakthrough.

Junk-K Fighter is built into every new V1.
Can we build one for you?

*Answer: Nope, Junk-K Fighter is a software algorithm.

**Answer: Nope, but V1 owners sure know it's there.

© 2015 VRI



Mike Valentine
Radar Fanatic

Call toll-free 1-800-331-3030

- ☐ Valentine One Radar Locator with Laser Detection - \$399
- ☐ Carrying Case - \$29
- ☐ Concealed Display - \$39
- ☐ SAVVY® - \$69
- ☐ V1connection™ - \$49
- ☐ V1connection™ LE - \$49

Plus Shipping / Ohio residents add sales tax

30-Day Money-Back Guarantee

Valentine One is a registered trademark of Valentine Research, Inc.

www.valentine1.com

Valentine One
RADAR LOCATOR

► **Valentine Research, Inc.** Ph 513-984-8900
Department No. YB16 Fx 513-984-8976
10280 Alliance Road
Cincinnati, Ohio 45242



by Aaron Robinson

HAS TESLA SUNK ITSELF WITH THE MODEL X?



It had been a few years since I last visited Tesla Motors, that enormous white sheet cake of a factory down at the muddy bottom end of the San Francisco Bay. The Fremont plant used to spit out half a million vehicles a year when it was a GM-Toyota joint venture, when it was a humming hive of American manufacturing vitality. Then it turned into an empty husk, and then Tesla acquired the deed in 2010 for a relative pittance. When I went to see the first Model S in 2012, there were a couple dozen cars in the employee lot. Tumbleweeds would not have looked out of place. Inside, a few robots practiced their tai chi moves with empty pincers, as there were as yet no panels to shuffle. And if you looked beyond the freshly painted and well-lit assembly area, the view faded off

into the shadowy darkness of the plant's deeper reaches. This past October, I exited Interstate 880 in Fremont for the debut of the new Model X crossover. Now, cars fill all the spaces, line the curbs, and spill into overflow lots. Trucks trundle in with deliveries, and minibuses shuttle people around. This dead factory is alive again.

Reporters who cover Silicon Valley get to see birth, merger, and death on a regular basis as tech companies come and go. Not so with us in the auto industry. Most of the brands we write about go back to our great-grandfather's day. The last successful automaker to start from scratch in America was the Lincoln Motor Company in 1920. My predecessors saw the rise of Bricklin and DeLorean; their predecessors, Lotus and Lamborghini; but Tesla belongs to me. I watched it evolve from a Menlo Park laboratory into a factory issuing thousands of paychecks. And I admit to feeling some irrational paternal pride.

Tesla is an American venture building American cars in America, so I can't understand some of the virulent hatred toward it. Okay, its business plan is fraught, its overhead is too high, and its product is expensive, imperfect, and subsidized by taxpayers. By this definition, it is a standard defense contractor. Sure, CEO Elon Musk took a Department of



► Tesla's new Model X may be fatally fascinating.

Energy loan. So did Ford (\$5.9 billion) and Nissan (\$1.45 billion). Should Musk have turned down the \$465 million he was offered? If you answer "yes," then you favor companies run by idiots.

Yes, I buy Musk's premise: Our future depends on moving to a sustainable energy source. Combusting hydrocarbons is a dead end; we all know that. Either the supply will run out or the planet will wither from its effects. If VW's diesel scam teaches us anything, it's to beware of dirty old dogs claiming new tricks. No matter

what the glossy ads say, powering vehicles with a carbon-based fuel is a grimy business. We all assume something better is coming, but somebody will have to get off their duff and make it happen. Musk, who pocketed \$165 mil from PayPal, could have disappeared into a life of ease on his own island. Instead, he volunteered for this.

Not that Musk is above reproach. He thought he needed a stunning technology statement in the Model X to affirm the brand's cred. He didn't. Teslas are already cool in west L.A., a tough place to earn the rank. Tesla just needs a crossover to flesh out its showroom, preferably one with a sub-six-figure price. Instead, the hysterically complicated Model X may prove to be the noose from which Tesla swings. The car is at least two years overdue and far more complicated than it needs to be. The giant curved windshield, the sensor-studded self-opening front doors, those "falcon wings," which rise at the speed of two arthritic old stage hands hauling up a Broadway curtain—they're all fascinating but unnecessary. The X would be a challenge for Toyota to build profitably, much less Tesla.

There's a feeling in Silicon Valley that the only problem with the auto industry is that the likes of Apple or Google hasn't yet hosed it with its genius. Eager young minds, certain of their infallibility. Musk said he didn't want to be another automaker that unveils beautiful show cars but sells dull conventionality. He's about to find out why concept cars stay concepts. The doors were among the X's novel systems that proved fussy at the Fremont launch party. I boldly predict that the X will be a warranty nightmare when it should have been a simple platform variant to rake in more cash.

Long-established car companies get to screw up. VW will survive Dieseltgate, as Toyota survived Accelerationgate and GM survived Ignitionswitchgate. But Tesla does not have the profits—indeed, any lasting profits—to weather a dud. Which is perhaps why, as I write this, investors are skeptical about the stock when, if anything, they should be rhapsodic over the new model and Tesla's fledgling battery business.

Frankly, I'm with Bob Lutz, who suggested recently that Tesla should make the Model 3 a gorgeous little hybrid with a gasoline range extender. It may dim the electric brand's snow-white purity, but at this point, it may also save the company. Tesla, you've come so far. Don't die on me now. ■



More 10Best awards than any other car.

Keeping with tradition, the restyled Accord has once again been named to the 10Best list by *Car and Driver*. The Accord has received this honor a record 30 times.



Accord

Accord Touring Sedan shown. *Car and Driver*, January 2016. ©2016 American Honda Motor Co., Inc.



by Ezra Dyer

■■■ A STUMP-PULLER TURNS TREE-HUGGER.



When I converted my '93 Bronco to a 7.3-liter Power Stroke diesel, one of my goals was to eventually run it on biofuel. Of course, that wasn't my main objective. Higher on the list were items like "get 500 pound-feet of torque" and "make loud turbo noises at all times." But yes, also: sneer down contemptuously at Prius drivers and their dirty war fuel. I'd probably need a bumper sticker so everyone would know how morally superior I am. Something to the effect of, "This looks like a 12-mpg Bronco, but it's actually got a diesel and furthermore it's running 100-percent biodiesel (B100), which the California Air Resources Board recently determined can reduce carbon emissions as much as 81 percent compared with petroleum." Unfortunately, I am physically incapable of applying a

bumper sticker to my vehicle, on the grounds that bumper stickers correlate with mental frailty, megalomania, and probably poor personal hygiene. Perhaps sustainability and emissions weren't my priorities at the outset, but running a 7.3 in an open-top vehicle makes you intimately familiar with that engine's major shortcoming: It's a foul thing, a 444-cubic-inch industrial zone. One day, sitting at red light in a Mazda, my three-year-old in the back seat declares, "I smell a Bronco!" Sure enough, there's a '90s Power Stroke pickup on the opposite side of the intersection. Time to find some carbon-cutting, sweet-smelling biodiesel.

I go to the Department of Energy's alternative-fuel website and discover an outfit called Piedmont Biofuels, a North Carolina biodiesel co-op with seven pumps around the Raleigh area. I send an email to Piedmont's president, Lyle Estill, and a few days later I'm on the scene, Eddie Bauer ready for biopower.

The co-op's members are a motley crowd, politically heterogeneous. As Estill writes in his book *Backyard Biodiesel*, "Some of Piedmont's members are far-right-winged survivalist nuts who want to pay for their fuel in constitution silver," while others are "hippie chicks who want to trade fuel for massages." That's such a weirdly specific example that I wonder if



► Fuel stations look different in the biodiesel community.

someone named Moonshadow actually rolled up to a pump and asked to get the rate in gallons per shiatsu.

I guess I'm somewhere in the middle, just a guy with a Bronco trying to save the world. Trouble is, there aren't enough fryolators on earth to satisfy our collective demand for transportation fuel. That's okay. Even so, once I'm fueled up on biodiesel, I plan to get real judgy. Oh, you're going to the gas station? Why not just strangle a pelican with one hand and an Angolan peasant with the other, you monster?

Estill gives me a tour of the facility, and I nod knowingly as he explains the functions of various tanks and pipes and doodads. Yep, yessir. You're definitely gonna need some esterification and transesterification up in there. The take-home, I think, is that producing fuel isn't a super-easy thing to do. At least, not for English majors. I'd always thought that diesels would run on smushed-up squirrel blubber, but Piedmont is hitting a tight spec—it maintains a reference library of fuel samples in case someone tries to blame the co-op for a blown motor. In a busy year, the facility produces a million gallons of fuel, so it's important to get it right.

Tour concluded, Estill hands me my new fuel card, and we head to the pump building. This is just like any other gas station except that it's an off-grid solar-heated shed made of straw. Proper insulation is important because B100 gels at low temps. It's also a solvent, so it might dissolve the gunk in your fuel system and clog the filter (I brought a spare). Oh, and biodiesel reacts with copper, which is bad news for your fuel gauge sending unit. But in terms of combustion, it's dandy stuff.

The aforementioned stinky Power Stroke smell, discernible by a three-year-old from 50 paces, is gone the moment I turn the key on my first tank of B100. I'd describe the new exhaust aroma as "grease fire at Arby's," which is actually a big improvement. Estill says that, depending on the feedstock for a particular batch, your exhaust can smell like dog food, lemon-infused almond oil, or, in the case of algae oil, rotting fish. Mmmm, I'm getting hungry already.

Piedmont makes no performance claims for its fuel, but I'd swear the Bronco runs quieter and makes more power on the plant juice. And with no smoke. I'm not rolling coal, but if I get some of that fish fuel I might be rollin' sole.

My problem now is that the Bronco, unlike a Prius, does not broadcast my environmental bona fides. And I'm not the kind of person who does things simply because they're worth doing—I need others to know about my good acts and experience a moment of existential crisis when they realize that they can't possibly measure up. I need my name on the building.

There is a solution. When I joined the co-op, I received a bumper sticker. "Biodiesel: Hometown Security." I haven't put it on, but I'm considering it. When it comes to alt-fuels, the tough choices never end. ■

**HANDLE
YOURSELF
WITH
CONFIDENCE
AND
STYLE**

**ANYWHERE.
ANYTIME.
WITH
ANYONE.**

Got a sudden stain on your perfect white dress shirt—just before an important meeting? Need to order a drink for your date? Concerned about how to manscape, buy the perfect gift, leave a dull party gracefully, or navigate the intricacies of any social event? *Esquire's The Biggest Black Book Ever* shows you how to do everything right, in every area of your life.



**AVAILABLE
WHEREVER
BOOKS
ARE SOLD**

\$24.95 (\$27.95 CAN) IN HARDCOVER

HEARST BOOKS



We found our most important watch in a soldier's pocket

It's the summer of 1944 and a weathered U.S. sergeant is walking in Rome only days after the Allied Liberation. He's only weeks away from returning home. He finds an interesting timepiece in a store and he decides to splurge a little on this memento. He loved the way it felt in his hand, and the complex movement inside the case intrigued him. He really liked the hunter's back that opened to a secret compartment. He thought that he could squeeze a picture of his wife and new daughter in the case back. Besides the Purple Heart and the Bronze Star, my father cherished this watch because it was a reminder of the best part of the war for any soldier—the homecoming.

He nicknamed the watch *Ritorno* for homecoming, and the rare heirloom is now valued at \$42,000 according to *The Complete Guide to Watches*. But to our family, it is just



The hunter's back

The Ritorno watch back opens to reveal a special compartment for a keepsake picture or can be engraved.

a reminder that nothing is more beautiful than the smile of a healthy returning GI.

We wanted to bring this little piece of personal history back to life in a faithful reproduction of the original design. We've used a 27-jeweled movement reminiscent of the best watches of the 1940s and we built this watch with \$26 million worth

of Swiss built precision machinery. We then test it for 15 days on Swiss made calibrators to ensure accuracy to only seconds a day. The movement displays the day and date on the antique satin finished face and the sweep second hand lets any watch expert know that it has a fine automatic movement, not a mass-produced quartz movement. If you enjoy the rare, the classic, and the museum quality, we have a limited number of *Ritornos* available. If you are not completely satisfied, simply return it within 30 days for a full refund of the purchase price.

Stauer 1944 Ritorno ~~\$147~~ Now only \$99 + S&P

1-800-333-2045

Promotional Code RTN391-02
Please mention this when you call.

To order by mail, please call for details.

Stauer®

14101 Southcross Drive W., Dept. RTN391-02
Burnsville, Minnesota 55337 www.stauer.com



Saving People Money Since 1936

**... that's before there were
modern turn signals.**

GEICO has been serving up great car insurance and fantastic customer service for more than 75 years. Get a quote and see how much you could save today.

geico.com | 1-800-947-AUTO | local office

GEICO®





CAR AND DRIVER'S 10BEST CARS FOR 2016

MAKING IT

10Best involves more than drawing up lists of our sub-\$80,000 favorites. Every year we enter our weeklong evaluation looking for new and improved combinations of virtues: value and engagement, performance and poise, sights and sounds, soul and character. The cars that earn this award do more than merely succeed on one or two criteria; they come to us fully formed, polished, complete. But how do they get that way? This year we delve deeper into our winners' makings to better explain why they won. Who builds and develops these cars? Where? How do they go about it? What is a 10Bester truly made of? There are, of course, varied answers because cars are not simple things. You do not buy them on Etsy, and we're not running a Maker Faire here. Automobiles are still the most complex and technologically advanced consumer products that man has ever devised. What follows in this section is our proof.

— THE EDITORS

BMW M235i

A PRODUCT OF ITS ENVIRONMENT

BY DAVEY G. JOHNSON

photography by CHARLIE MAGEE

HOW WE'D BUILD IT:

We'd keep our M235i trim by opting for BMW's no-cost synthetic SensaTec upholstery, adding the dealer-installed limited-slip differential (\$3240), and saving 200 bucks over the Cold Weather package by opting for just the heated seats (\$500). The rest of our choices are no-cost decisions: summer tires to best exploit the car's handling prowess and, naturally, a manual transmission. Total damage: \$48,885.

To sort out the "how" of the BMW M235i's construction, one must start roughly 30 million years ago, when the African continental plate started its eons-long rumble with the Eurasian plate, squeezing the Alps up out of the earth. Fortuitously, a century ago, an aero-engine factory set up shop in Munich, at the foot of the Bavarian swath of these mountains, whereupon it started building motorcycles and later moved to automobiles.

The "how," then, is inextricably linked to the "where." Imagine if Henry Ford and William Crapo Durant had set up shop in Denver, logging early development miles on the serpentine, challenging Million Dollar Highway (U.S. Route 550). Perhaps Detroit's boulevardiers, so perfect for eating up the long, flat miles of the American Midwest, might have turned out differently. Perhaps more like BMWs.



ASSEMBLY PLANT: LEIPZIG, GERMANY
OTHER U.S.-MARKET MODELS
CONSTRUCTED AT LEIPZIG: i3, i8

Famed for their driver-centered nature, BMW's vehicles have lately become more things to more folks. It sold nearly 100,000 trucks in the U.S. this year, almost a third of the brand's volume. But this M variant of the 2-series still does exactly what we expect of the company's machines. The steering informs you of the road's every nuance. Squeeze the brakes for a corner and the lower-right side of your foot drops easily onto the accelerator to match engine revs for a downshift. It's the sort of stuff that always seemed so natural to the marque's cars that one assumed the engineers didn't even sweat it, that this sort of correctness was baked into Bavarian genes sometime in the Middle Ages and only revealed itself upon the advent of the automobile.

We once heard this perhaps-apocryphal story: American BMW dealers in the Sun Belt sent a litany of complaints back to Germany about the uselessness of Euro-spec air-conditioning systems. The factory scoffed, but finally deigned to send over an engineer as a sop to an important market. The poor guy was thrown in the back seat of a black car, windows rolled up, and driven across a summer-scorched Texas until Munich got the message.

The flip side of that sometimes-maddening Teutonic belief in its engineering rectitude is that we still have cars like the M235i, even as the need to be all things to all people around the globe conspires to put these sorts of cars at risk.

The M235i takes everything BMW has traditionally done well and concentrates it into a compact, livable package. The 320-hp 3.0-liter turbo six doles out sweet, smooth power. The chassis isn't punishing the way the M235i's larger M-badged siblings can be. And with the M2 now on the way, the M235i should be forever freed from the need to post fantasy performance numbers.

While BMW has succumbed to selling indulgences, the M235i coupe stands as the right automobile for just about any road, whether your daily commute is a stoplight horror or the sort of Alpine pass that BMW engineers slalom home on after heli-skiing weekends. The guys responsible for this wonderful thing should probably just nail a picture of the car to the front door in Munich. It worked for Martin Luther.

SPECIFICATIONS

BMW M235i

VEHICLE TYPE: front-engine, rear- or 4-wheel-drive, 4-passenger, 2-door coupe
BASE PRICE \$45,145-\$47,145
ENGINE: turbocharged and intercooled DOHC 24-valve 3.0-liter inline-6, 320 hp, 330 lb-ft
TRANSMISSIONS: 6-speed manual, 8-speed automatic with manual shifting mode
CURB WEIGHT 3500-3650 lb
EPA CITY/HWY 19-20/28-31 mpg

“EXHIBITS THE KIND OF FOCUS
THAT ONE USED TO TAKE
FOR GRANTED IN A BMW.” —J.Lorio

ALPINE FRESH

These serpentine Alpine roads made BMW's reputation just as surely as all those great BMWs made these roads legend. The handling magic of the M235i is probably best explained by its development engineers' daily commutes.



CADILLAC CTS VSPORT

KEVIN ZELENKA;
PERFORMANCE ENGINEER,
VEHICLE DYNAMICS;
RACES IN CHUMPCAR

JASON KOLK;
PERFORMANCE ENGINEER, ELSD;
AUTOCROSSES AN SCCA ESP CHEVROLET CAMARO

DAVE BUSWELL,
PRODUCT ELECTRONICS TECHNICIAN,
RACES AN OPEN-WHEEL MODIFIED CAR

CLAUDIA DANIELEWICZ,
SENIOR DESIGN ENGINEER,
RACES A KTM 250 XCF
ENDURO MOTORCYCLE

JOE HODGESON,
BRAKE-TEST TECHNICIAN,
RACES AN OPEN-WHEEL MODIFIED CAR

KRISTEN HOLDWAY,
DESIGN RELEASE ENGINEER,
LAPS A FORD FIESTA ST

VAUGHN SCOTT,
CHASSIS CONTROL CALIBRATION
ENGINEER,
BUILT A PROTOTYPE CAR IN HIS
GARAGE FROM A FORMULA FORD
AND A SUZUKI GSXR1000



MIRZA GREBOVIC,
ASSISTANT PERFORMANCE ENGINEER,
LAPS A CHEVROLET CAMARO SS 1LE

JOHN BUTTERMORE;
LEAD DEVELOPMENT ENGINEER, V-SERIES;
RACES A C6 CORVETTE IN SCCA T1 OR T2,
DEPENDING ON HIS MOOD

JASON STEEB;
PERFORMANCE ENGINEER, NOISE
AND VIBRATION;
RACES A FORMULA FST

MIKE RYBA;
VEHICLE PERFORMANCE ENGINEER,
POWERTRAIN;
RALLIES A HONDA CIVIC

DREW CATTELL,
VEHICLE PERFORMANCE
ENGINEER,
CAMPAIGNS A ROTAX KART IN
ENDURANCE RACES

TONY ROMA;
CHIEF ENGINEER, CADILLAC ATS,
CTS, AND V-SERIES;
PILOTS AN SCCA A-SEDAN
PONTIAC FIREBIRD

BRIAN WALLACE;
PERFORMANCE ENGINEER,
POWERTRAIN INTEGRATION;
RACES AN SCCA A-SEDAN
GEN-THREE CAMARO

NATHAN SUMNER,
SENIOR DESIGN RELEASE ENGINEER,
RACES AN SCCA A-SEDAN CADILLAC CTS-V

RACING IMPROVES THIS BREED

BY K.C. COLWELL
photography by **ANDREW TRAHAN**



CAR AND DRIVER'S
10 BEST CARS FOR 2016
01 JAN / 20 SIXTEEN

HOW WE'D
BUILD IT:

The Vsport package is mostly complete as-is. We'd add the optional Dark Adriatic Blue Metallic paint (\$495) and the performance brake pads (\$100) for an out-the-door price of \$61,545.



ASSEMBLY PLANT: LANSING, MICHIGAN
OTHER MODELS: ATS, CHEVROLET CAMARO

When we heard Cadillac Alpha-platform chief Tony Roma talking about some of his team moonlighting behind the wheels of their own race cars, we thought it might be fun to meet a few of them. Wary of the flack-favorite "our-guys-are-car-guys-because-they-own-cars" stunt, which is both overused and often overblown, and expecting

just a handful of engineers to show up, we asked Cadillac if we might be able to set up a track day. When that Friday afternoon came, enough racers had RSVP'd that we could have filled a grid.

The 15 pictured here—more wanted to attend but were needed elsewhere—have all helped make the latest generation of the Cadillac CTS the best yet, the sports sedan that has finally put GM on par with its German rivals. Each of them races, and it's that extracurricular pursuit, plus GM management's new willingness to harness it to good effect, that gives the 420-hp CTS Vsport such an edge.

Communication is as critical to car development as it is to any workplace, and these engineers speak a common language learned in competition and while loitering in paddocks. But what isn't said—or rather, what doesn't have to be said—allows Roma's teams to move faster and accomplish more. It's not just lead development engineer and two-time SCCA National champion John Buttermore, who campaigns his T1 C6 Corvette Grand Sport in the slower T2 class with a throttle restrictor and ballast, just because he wants more-challenging racing. It's also Kristen Holdway, a design release engineer who, to the dismay of her colleagues, tracks a Ford Fiesta ST. They all know what a firmer bushing can do for steering feel, or how an oil cooler will impact durability and reliability. Roma says that when his team of racers uses its

knowledge to speed through development faster, it saves money that can be spent elsewhere. Roma never has to explain why allocating budget to improve the ride or steering response is worth it. The results are obvious to these track rats.

To us, too. The attention to detail in suspension tuning puts the CTS a notch above the Germans in this class. The Vsport chassis speaks to drivers as if they're all weekend warriors, but without forgoing the balance between handling and ride, which in this case is among the best on the road today. The steering is natural, talkative, and well weighted. It is the kind of chassis harmony that BMW championed in the 1990s. (One might argue that the full-boat CTS-V improves the balance even further over the Vsport, but that version exceeds our 10Best \$80,000 base-price limit.)

CTS critics point to an interior that tries too hard and the sometimes-frustrating CUE infotainment interface, which doesn't try hard enough. For 2016, Cadillac has responded by making Android Auto and Apple CarPlay standard features.

"For racers, by racers" is the internal motto for the Cadillac Alpha teams, and it fits. But it doesn't take reading those words to know that Cadillac makes a great car. Drive a Vsport and the communication from the chassis is clear and concise, just like the unspoken communication between these racer-engineers.

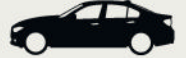
SPECIFICATIONS
CADILLAC CTS VSPORT

VEHICLE TYPE: front-engine, rear-wheel-drive, 5-passenger, 4-door sedan
BASE PRICE \$60,950
ENGINE: twin-turbocharged and intercooled DOHC 24-valve 3.6-liter V-6, 420 hp, 430 lb-ft
TRANSMISSION: 8-speed automatic with manual shifting mode
CURB WEIGHT 3950 lb
EPA CITY/HWY 16/24 mpg



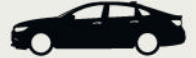
CANDIDATES FOR THE REWORK LOT

For deficient dynamics:



BMW 328i/340i M SPORT

"This car needs more help."
— T. Quiroga



CHEVROLET MALIBU 2.0T

"Is this better than the Accord? Drive over that first big bump and listen to the hollow thunk of the suspension and I think you'd conclude not."
— E. Dyer



DODGE CHARGER SRT HELLCAT

"In the war between weight and power, there will be thousands of tire casualties."
— E. Alterman



FORD MUSTANG GT

"Hey! What happened to my revs?"
— D. Pund



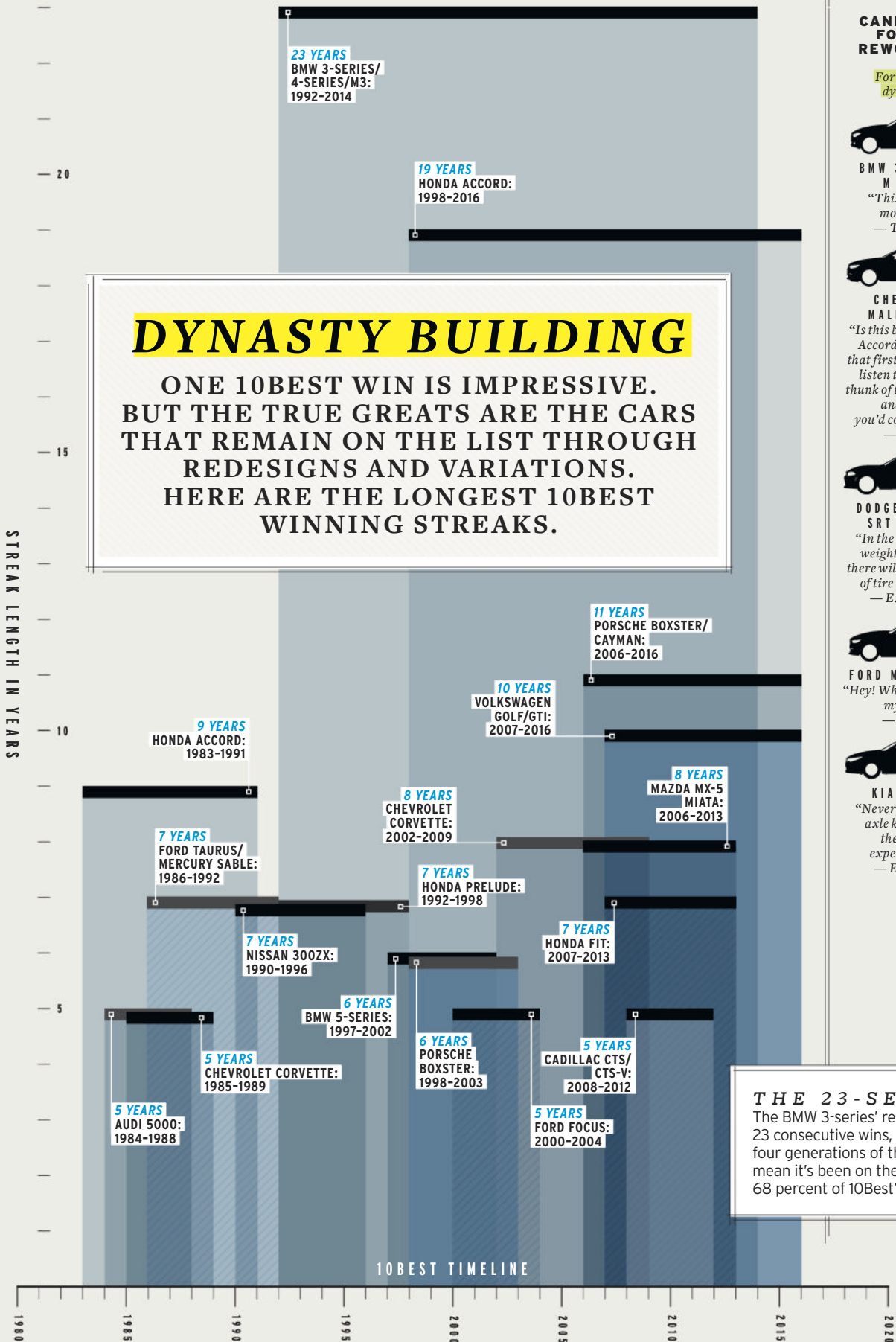
KIA OPTIMA

"Never feels like one axle knows what the other is experiencing."
— E. Johnson

DYNASTY BUILDING

ONE 10BEST WIN IS IMPRESSIVE. BUT THE TRUE GREATS ARE THE CARS THAT REMAIN ON THE LIST THROUGH REDESIGNS AND VARIATIONS. HERE ARE THE LONGEST 10BEST WINNING STREAKS.

STREAK LENGTH IN YEARS



THE 23-SERIES

The BMW 3-series' remarkable 23 consecutive wins, through four generations of the model, mean it's been on the list for 68 percent of 10Best's 34 years.

CHEVROLET CAMARO

HOW GM'S FAVORITE TOY BEGETS YOUR FAVORITE TOYS

BY JARED GALL

photography by ANDREW TRAHAN

HOW WE'D BUILD IT:

As much as we like the new Camaro V-6, we'd still opt for the base-level V-8 car, the 1SS with the manual transmission. We'd add: Magnetic Ride Control (\$1695), dual-mode exhaust (\$895), 20-inch aluminum wheels (\$800), Heavy-Duty Cooling and Brake package (\$485). Total: \$41,170.



ASSEMBLY PLANT: LANSING, MICHIGAN
OTHER MODELS: CADILLAC ATS, CTS

Proving grounds are the ultimate automotive amusement parks, with circles and ovals for high-speed testing and vast black lakes—huge parking lots without light poles or concrete logs—for testing at-the-limit and way-beyond-the-limit roadholding. Proving grounds also contain less-exciting stuff such as salt baths, heat-soak sheds, and miles of intentionally crappy pavement for tuning suspensions and exposing weaknesses. This is where auto-

makers hone their wares and, more important, find their voices and define their identities.

As General Motors has recently emerged as the unlikeliest of hit factories, the explanation for why and how snakes through the wooded hills of its proving grounds in Milford, Michigan. Within this vast expanse is GM's crucible, its very own racetrack, laid out over 200 rolling acres. The Milford Road Course (MRC) is composed of 18 turns over 2.9 miles, its corners including approximations of turns from the Nürburgring and Virginia International Raceway, among others, although all are tweaked for maximum deviousness.

"There's not a straight braking zone on this track," says Camaro lead development engineer Aaron Link as he brakes hard—and not in a straight line—into a quick right-left transition. "So, by the time you turn in, a lot has already happened."

In the new, sixth-generation Camaro, it means that a lot is happening down below, where the front struts and rear links keep the tires' contact patches firmly and evenly glued to the pavement and the car pointed precisely where the driver intends. Some competitors seem tuned to beat up their occupants in a way that places a theatrical "sportiness" above actually controlling wheel and body motions. The Camaro seems to be doing everything it can to prevent abusing the driver.

Link clips his apex and tracks out so wide that we'd swear he's about to smear red side-mirror paint along the Armco. The straight climbs nearly 135 feet from MRC's



lowest point to its highest. "In the fastest cars," he says, "the straight-away never gets completely straight." A Corvette Z06 will clear 160 mph here; the Camaro SS surpasses 150. Its LT1 V-8 makes 455 horsepower and 455 pound-feet of torque, and it impresses with the same punchy startup bark and pissed-off snort at full throttle as in the Corvette.

For the first time, the V-8 has a worthy understudy. General Motors, purveyor of so many lackluster six-cylinders in so many models for so many years, has never made such an outstanding V-6 as the 3.6-liter that is new in the Camaro. We found ourselves comparing it to the original 1991 Acura NSX's mill.

The Chevy engine's redline is lower and the torque base much broader and beefier than the 3.0-

SPECIFICATIONS

CHEVROLET CAMARO

VEHICLE TYPE: front-engine, rear-wheel-drive, 4-passenger, 2-door coupe
BASE PRICE \$28,490–\$37,295
ENGINES: DOHC 24-valve 3.6-liter V-6, 335 hp, 284 lb-ft; 16-valve pushrod 6.2-liter V-8, 455 hp, 455 lb-ft
TRANSMISSIONS: 6-speed manual, 8-speed automatic with manual shifting mode
CURB WEIGHT 3600–3760 lb
EPA CITY/HWY (C/D EST) 16–18/25–29 mpg



“A CORVETTE WITH A BACK SEAT.” —J.Gall

liter Honda V-6, but the sound, the rip to redline, and the way it overflows with character make it like few others. The standard six-speed slides easily from gear to gear, and the eight-speed automatic pops off shifts with a quickness that rivals the best dual-clutch transmissions.

MRC's straightaway dives over a crest and barrels into one of the tightest corners on the track, a decreasing-radius, double-apex right. A 2005 SAE paper written by some of the engineers who designed the track explains in dry engineering understatement what Link's brain is processing as the car turns 110 mph into brake heat and darts toward the first apex: “While braking for Turn 1 the vehicle must initiate a turn. This is a potentially difficult Vehicle Dynamics mode termed Steering while Braking. Suspension geometry and compli-

ances, tire construction, shock valving, and brake proportioning are developed here.”

But the countless development laps logged in mules ensure that today all four tires strain predictably, the car pivots and glides through the corner, and we bawl up a steep hill into a series of undulating esses.

Even if most Camaros will never see a racetrack, the lessons learned here are vital. “This track covers a lot of scenarios the car can be put into,” says Link. “There's a bit of magic to it, a human element, not just science, that says, ‘Well, this is the number, so that's it.’ There's a feel that you have to strive for.” Getting that last little bit just right, delivering a car that responds organically to what the driver demands, is what separates a 10Best car from the rest.

GM'S PLAYGROUND

The Milford Road Course was born a decade ago from a 1.9-mile oval used for truck-durability testing, and more than half of its distance traces the oval's footprint. But the infield sections are far more thrilling—and illuminating—than any oval.



FORD MUSTANG SHELBY GT350/GT350R

THE HEART OF THE MATTER

BY EZRA DYER

photography by ROY RITCHIE

HOW WE'D BUILD IT:

Start with the GT350R and add the Electronics package. Yes, that's expensive (\$66,495) but still a bargain. With the Electronics package, Ford installs air conditioning and a stereo, but the car still weighs 86 pounds less than a GT350 Track Pack, partly because the R has carbon-fiber wheels and no back seats.

It starts with the crankshaft. In most cars, the crank is just a chunk of cast iron spinning away in the block. In the Shelby GT350, though, the crank is the soul of the machine. It's steel that's forged and gun-drilled down its centerline to shave mass and relieve crankcase pressure. To that estimable piece of metal are attached eight connecting rods, the four crank throws spaced at 180-degree intervals instead of the traditional 90. This is more profoundly important than it might sound.

Upstairs in the block, a plasma-transferred wire-arc process finishes the aluminum bores with a rugged iron skin, 100 microns at a time. The largest possible 94.0-mm bore helps bump displacement from the Mustang GT's 5.0 liters to 5.2 in the Shelby, allowing bigger valves (hollow-stem intake, sodium-filled exhaust) atop this aluminum lung.



ASSEMBLY PLANT: FLAT ROCK, MICHIGAN
OTHER MODELS: FUSION

All of this—the flat-plane crank, the ruthlessly excised rotating mass, the deep-breathing heads—speaks to wide-band, high-rpm horsepower. This so-called Voodoo engine is built for a track, and not the kind with a Christmas tree and a burnout box. This is the heart of a road-course stormer, hand-built by a two-person team on a moving line. If the whistle blows and an engine's not done, the team punches out and finishes it the next day. This is not the type of attention typically lavished on a \$50,000 car. Or, let's just say it: a Mustang.

The GT350 is more than an amped-up GT. Designers lowered the hood for better aerodynamics, and they threw in a carbon-composite radiator-core support that's so pretty it doesn't need a beauty

cover, thus saving 1.9 pounds. New front fenders swell over a track that's an inch wider than a Mustang GT's, accommodating front rubber that ranges from fat (295/35-19 on the GT350) to morbidly obese (305/30-19 for the R). Throw in optional MagneRide dampers, six-piston front Brembos, and Recaro cloth seats and you're not nearly done with the Shelby upgrades. If you tried to build a GT into a GT350, your list of part numbers would look like the NSA's phone records.

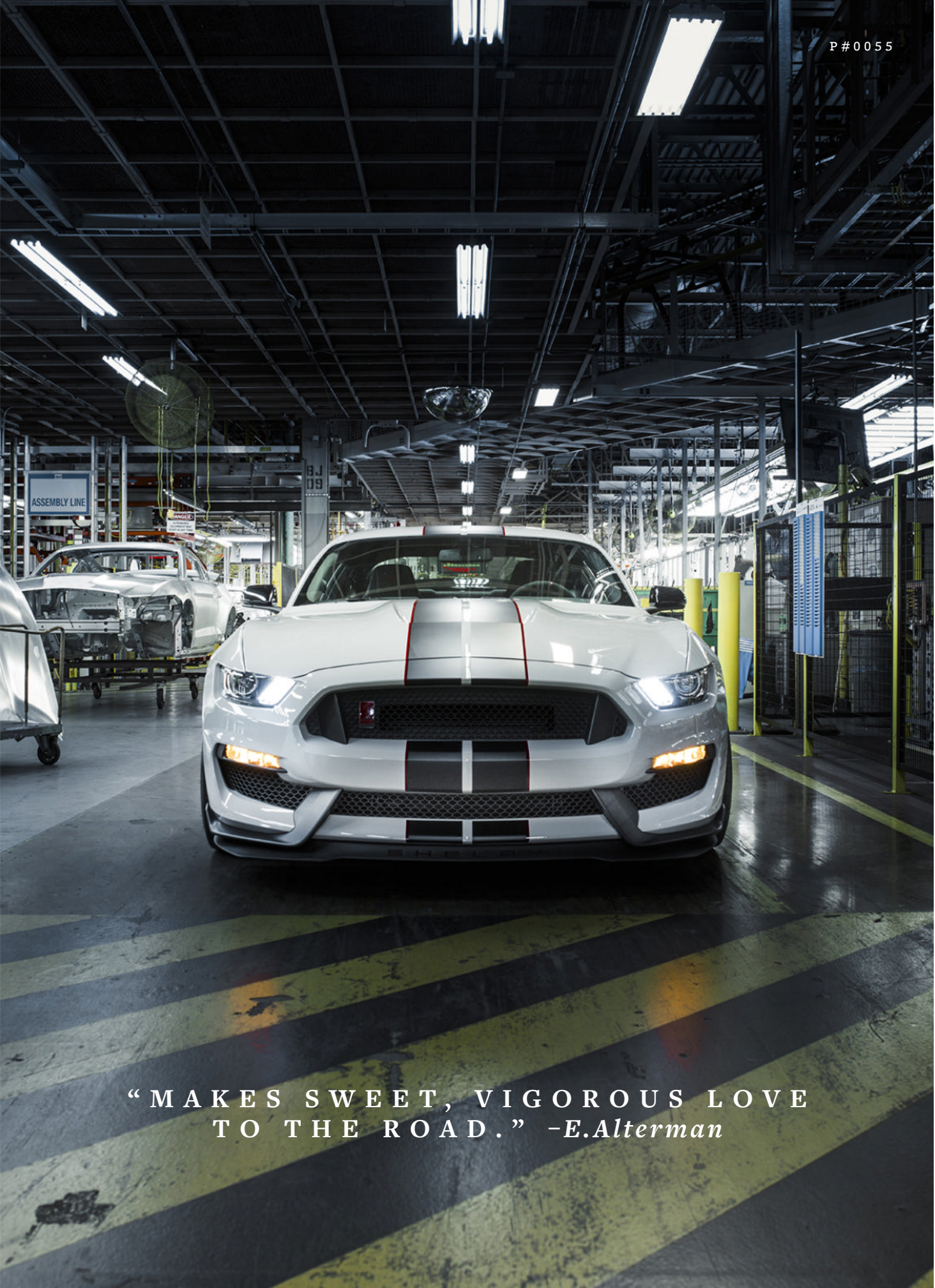
All those performance components, honed and tuned and machined, take the Shelby nameplate in an entirely surprising direction. Shelby's eponymous cars, right up through the most recent GT500, were manifestations of his personality—over-the-top, belligerent, and entertaining, if not enlightening. These Shelys, though, are holistic performers in the European idiom, emphasizing specific output, low unsprung weight, shift feel, and other muscle-car heresies.

What would Shelby have thought of a flat-plane crank? The latest cars to bear his name sound not like a Ferrari or a Mustang but like a Mustang racing a Ferrari. It's a glorious noise, an 8250-rpm declaration of new fundamentals. In an era of engineering homogeneity, of subtle variations on familiar themes, the GT350 and GT350R are radical departures. These are not just unlike any other Mustang. They're not like any other car, period.

SPECIFICATIONS

FORD MUSTANG SHELBY GT350/GT350R

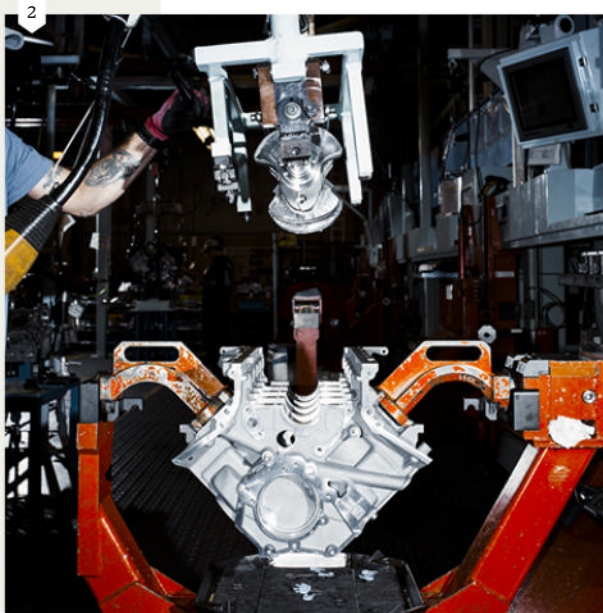
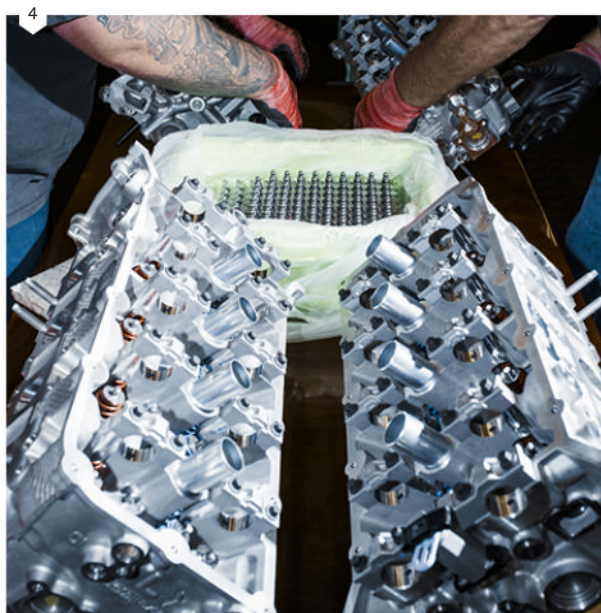
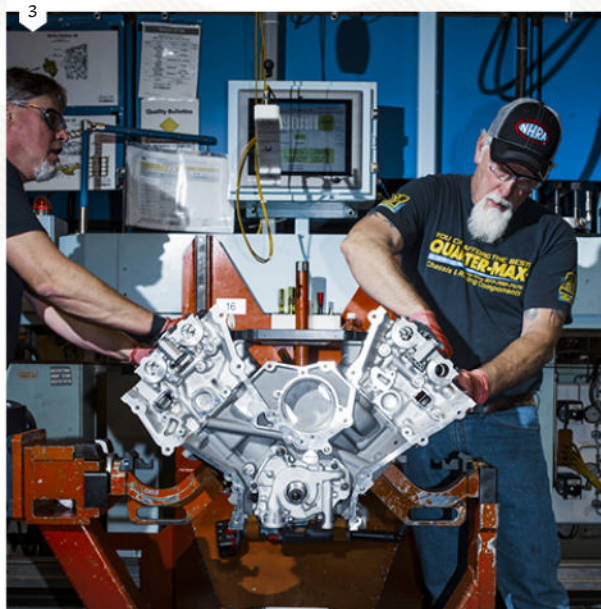
VEHICLE TYPE:	front-engine, rear-wheel-drive, 2- or 4-passenger, 2-door coupe
BASE PRICE	\$49,995-\$63,495
ENGINE TYPE:	DOHC 32-valve 5.2-liter V-8, 526 hp, 429 lb-ft
TRANSMISSION	6-speed manual
CURB WEIGHT	3700-3800 lb
EPA CITY/HWY	14/21 mpg

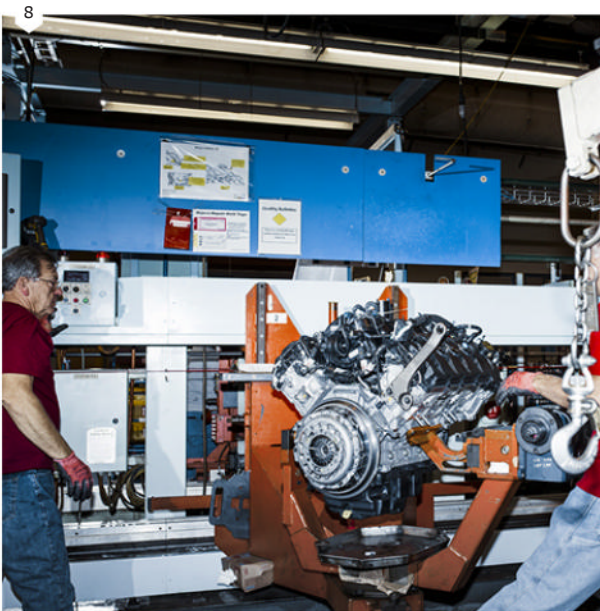
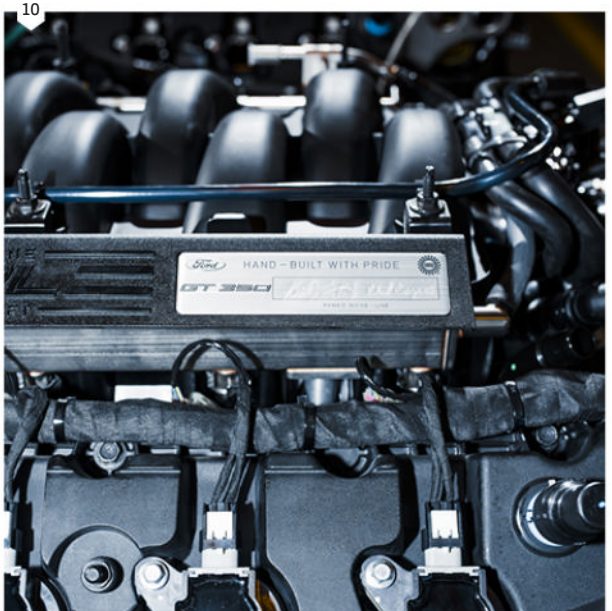
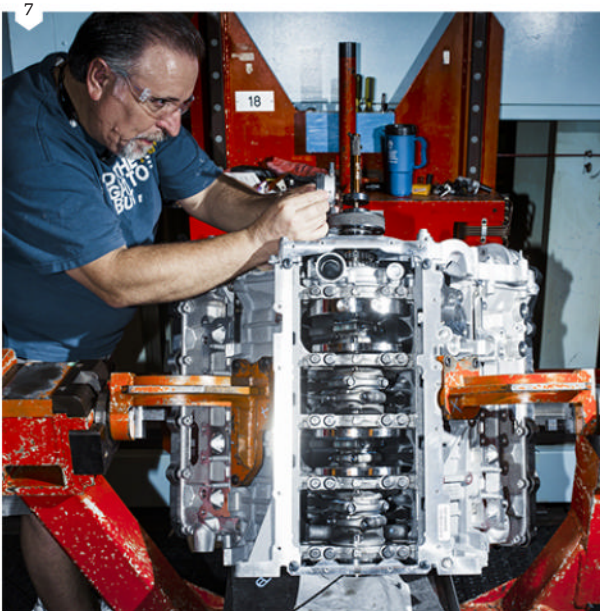
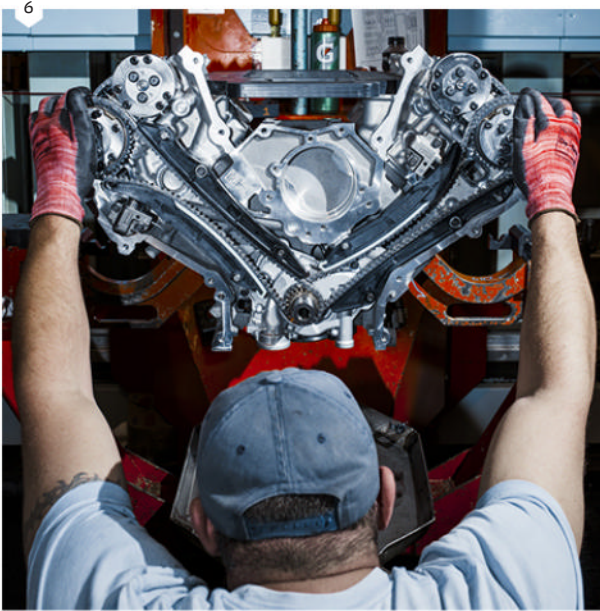


“MAKES SWEET, VIGOROUS LOVE
TO THE ROAD.” -E.Alterman

THE VOODOO THAT THEY DO

Fittingly, Ford's Voodoo V-8 assembly begins with the car's most-hyped part, the flat-plane crank. After removing the five cross-bolted main caps from the block [1] and fitting the bearings, builders lower the crank into place [2]. They insert the rod-piston assemblies through the top and mount [3] the pre-assembled cylinder heads [4]. Camshafts and timing chains get fitted [5, 6] before the team measures crankshaft end-play [7]. Finished engines [8] are spin-tested [9], stamped with the builders' signatures [10], and readied for final assembly [11] where they are married to a GT350.





HOW THEY'RE MADE

BY DON SHERMAN

illustrations by TODD DETWILER

You may not be surprised to hear that cars do not spring all shiny and dew-studded from beneath lily pads, ready to hit the road. In fact, the car-creation odyssey makes NASA's Journey to Mars program seem like a Caribbean luxury cruise. While we frequently address elements of the design and development process in these pages, this is the first time we've presented the entire start-to-finish plan; this year's 10Best celebration seemed like the perfect time and place to do so. One domestic and one import manufacturer—both requesting anonymity for competitive reasons—helped compile this guide to how cars are made.

We gathered related tasks under five headings. The "Sharing Is Caring" graphic depicts some of the back-and-forth negotiation and, ideally, cooperation linking various phases of the process.

The time required is the most interesting and secretive part of a car's gestation; a crash program to replace a dead-on-its-wheels product may take only half the time invested in a normal, full-redesign effort.

In our illustration, the clock begins when the generals gather to spur their troops to action. The end is when the new model reaches showrooms. On average, the entire process takes 72 months. There's overlap to save time, as revealed by the start and finish months listed in each of the five category headings. After-sale activities—including service issues, continuous improvement, and midlife face lifts—are not included in this account. That's for another 10Best.

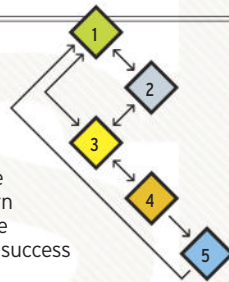
1. INVENTION

MONTHS 0-72

- Research market, including in-house and field investigations, to identify the role of this product and its components in the global portfolio; define separation from similar models sold by sister brands
- Identify special features, advantages, and potential world, U.S., or segment firsts
- Define competitive set, target customers; set curb-weight, fuel-economy, and performance goals
- Competitive assessment
- Powertrain selection
- Budget, funding, pricing, investment considerations
- Computer-aided-engineering (CAE) analysis
- Customer, press, analyst clinics

SHARING IS CARING

Communication is a daunting challenge in any large organization. Because automotive tastes often turn on a dime, fast and effective negotiations are key to the success of every new car.



2. DESIGN

MONTHS 0-72 (FOLLOWING MARKET RESEARCH)

- Interior—sketches, theme selection, model build, continuous reviews
- Exterior—same as above until design freeze
- Exterior colors, interior-trim materials selection
- Wind-tunnel assessment of theme models
- Concept creation for management presentation, potential auto-show use
- Additional CAE
- Management and engineering reviews

3. ENGINEERING

MONTHS 0-72 (CONCURRENT WITH DESIGN)

- Additional CAE
- Customer clinics aimed at gathering current model feedback, suggestions for improvements
- Research advanced technologies—engines, transmissions, motors, electronic controls, manufacturing techniques (painting, metal forming, plastic molding), and emerging trends
- Package, layout studies
- Body design and development for crashworthiness, weight, durability (in conjunction with CAE efforts)
- Aerodynamic development
- Design, development, tuning, validation (in-lab and on-road) of:
 - Powertrain
 - Chassis
 - HVAC, infotainment, seats, lighting systems
- Hot-, cold-, wet-weather tests
- Crash tests
- Fuel-economy evaluations
- Design for manufacturing and assembly studies
- Component and manufacturing cost analysis
- Collaborate with suppliers for R&D of purchased components
- Safety and emissions certification

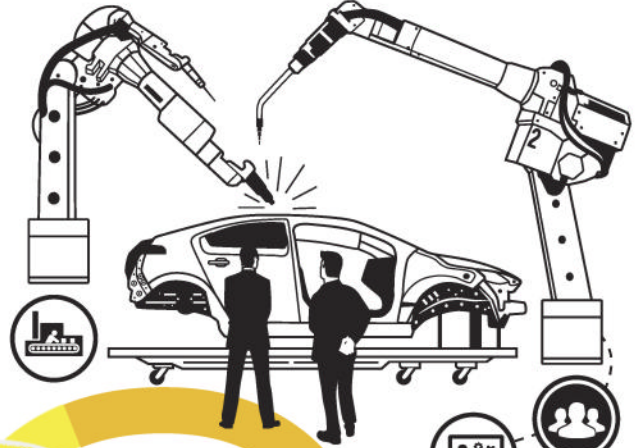
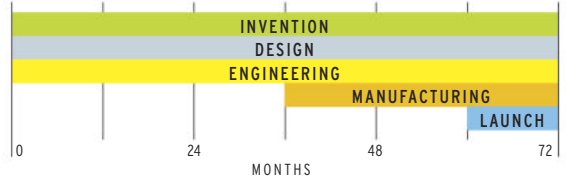
4. MANUFACTURING

MONTHS 36-72

- Design for manufacturing and assembly
- Construct or modify production facilities
- Tooling design, construction, validation
- Pilot builds to validate process and parts
- On-line preproduction builds
- Quality improvements
- Confirm that production vehicle meets performance targets
- Train workforce
- Collaborate with suppliers
- Commence production of saleable autos

OVERLAPPING TIMELINES

Some makers are quicker on their feet than others. The timing shown here is typical of the months needed to replace an existing model with a totally fresh design. Hurry-up programs can cut the time required in half.



5. LAUNCH

MONTHS 60-72

- Market research
- Naming research (if needed)
- Define pricing
- Develop marketing theme
- Introduce product to dealer body
- Plan logistics (flow of vehicles to dealers)
- Create promotional (media and advertising) materials
- Craft presentations for management, auto shows, press, social media, dealers, analysts

CAR AND DRIVER'S
10 BEST CARS FOR 2016
01 JAN / 20 SIXTEEN

CANDIDATES
FOR THE
REWORK LOT

*Needs powertrain
remediation:*



HONDA CIVIC
"I want to drive a
manual version."
— M. Sutton



**LEXUS IS200T
F SPORT**
"Between the turbo's
reluctance to spool up and
the transmission's
reluctance to kick down,
bursts of speed require a
waiting room."
— J. Phillips



**MAZDA 6 i GRAND
TOURING**
"Its chassis and
steering live up to the
promise, but the
engine is only adequate."
— J. Lorio



**VOLKSWAGEN GOLF
SPORTWAGEN TDI**
"Dirty cheating bastard."
— M. Duff

*Value proposition
too low:*



ACURA ILX A-SPEC
"Utterly pointless
in a world containing the
Honda Accord."
— M. Duff



MAZDA CX-3
"Its only major flaw is not
being a Mazda 3."
— D. G. Johnson



MERCEDES-AMG C63 S
"Big, dirty fun,
but so are fat hookers."
— J. Phillips



**PORSCHE MACAN
S / TURBO**
"Why not just buy a
Cayenne?"
— M. Duff



HONDA ACCORD

A PART OF THE FAMILY

BY JEFF SABATINI

photography by ROY RITCHIE

Querying any of the 4250 workers at Honda's Marysville, Ohio, assembly plant about what makes the Accord such a great car is akin to asking a parent why their child is special. They show no shame in taking credit. You are not likely to hear much said here about the Accord's tremendous value, its packaging, or its sublime combination of ride and handling. Those are the kinds of things we say about the Accord. At Marysville, they talk about pride

and tradition and brothers and sisters and family, the words tumbling forth with a fervor usually reserved for Ohio State football.

"Honda matters to me," says Amy Dixon, a team leader in assembly. Dixon started with Honda 27 years ago, when she was 20. "Their airplanes matter to me. Their lawn mowers matter to me."

She is typical of the Marysville plant, where 69 percent of the workforce has at least one decade of experience and almost half the



ASSEMBLY PLANT: MARYSVILLE, OHIO
OTHER MODELS: ACURA ILX, TLX

employees have been there for two. Honda says this depth of expertise regularly pays off in improved quality. This past fall, for instance, an associate came up with a new

10MOST CARS

HERE ARE YOUR VOLUME SELLERS, AMERICA:

1

TOYOTA CAMRY (326,330)

A Whirlpool on wheels, trusted by the masses.

2

TOYOTA COROLLA (278,742)

See Camry, only smaller, duller, and more affordable.

3

HONDA ACCORD (264,814)

Where our circle overlaps with John Q. Public's on the Venn diagram.

4

NISSAN ALTIMA (262,424)

The other high-volume Japanese mid-sizer.

5

HONDA CIVIC (249,749)

The outgoing model sold well. We like the new mini-Accord.

6

FORD FUSION (231,475)

As sophisticated as a family car can look.

7

HYUNDAI ELANTRA (193,962)

A feature-laden value for the status-averse.

8

CHEVROLET CRUZE (177,970)

Hey, at least they gave us a diesel.

9

FORD FOCUS (163,864)

A former 10Best winner. Look for the forthcoming 350-hp RS model to make a run at next year's list.

10

HYUNDAI SONATA (157,680)

Polished and improved to seem more Camry-like than ever.

Sales data from
January through
September 2015,
as reported by
Automotive News.

HEY, MACA-WRETCHED!

Remember that "Macarena" song? It's No. 7 on Billboard's All-Time Top 100. As ever, popularity doesn't necessarily equate with an award-winning product.

"SOMEONE WHO CARES
OBVIOUSLY HEADED
DEVELOPMENT." -D.Sherman

way to position engines as they were being installed. A \$45 tool was built, forestalling any further line stoppages due to engine-mount misalignment.

Keep the line running and Marysville can build 440,000 cars each year. That's capacity enough to swallow all the other models on our 10Best list combined. Indeed, the Accord is the sole high-volume product to earn this award year after year. Both of Honda's Japanese rivals, Nissan and Toyota, also manufacture in the U.S., in bigger plants that are just as highly regarded as Marysville. Yet, we find neither of their mid-size sedans as engaging as the Accord. The last time either one cracked 10Best, the internet wasn't much of a thing,

and Honda's family car had already racked up nine trophies in a row. Its most recent streak, including this year, stands at 19.

Marysville opened in 1979 with 64 associates dressed in identical white uniforms building motorcycles. Accord production launched on November 1, 1982, and today the pioneering facility is Honda's global "mother" plant for the model. Honda wasn't the first foreign automaker to assemble cars in the U.S., but Marysville was the first modern greenfield assembly plant built by a foreign automaker here.

Common knowledge said that shiftless American workers couldn't build cars to Japanese quality standards. Yet today, plants owned by nine other foreign brands



SPECIFICATIONS HONDA ACCORD

VEHICLE TYPE: front-engine, front-wheel-drive, 5-passenger, 2-door coupe or 4-door sedan
BASE PRICE \$22,925-\$35,400
ENGINES: DOHC 16-valve 2.4-liter inline-4, 185 or 189 hp, 181 or 182 lb-ft; SOHC 24-valve 3.5-liter V-6, 278 hp, 251 or 252 lb-ft
TRANSMISSIONS: 6-speed manual, 6-speed automatic with manual shifting mode, continuously variable automatic
CURB WEIGHT 3200-3600 lb
EPA CITY/HWY 18-27/28-37 mpg

HOW WE'D BUILD IT:

The 189-hp Accord Sport is one of the great deals extant, starting—and in our case, ending—at just \$24,985. Staying with the manual transmission means forgoing the Honda Sensing safety equipment. And we'd have our sedan sprayed (at no extra cost) in the newly available and attention-getting San Marino Red.

dot the American countryside like Chick-fil-A franchises. Honda has opened three more assembly plants in the United States, with a fourth on the way. And 13 of Marysville's "original 64" are still employed by Honda in Ohio.

Just as Marysville builds many Accords, there are many Accords to build. They've all been updated for 2016 with minor styling updates and chassis tweaks. And they are all good, though some are better. A manual transmission worthy of a sports car can be found in our favorite, the four-cylinder, four-door Accord Sport. Or you can get a six-speed with a third pedal mated to the 278-hp V-6 in the coupe. That same V-6 with a proper six-speed automatic turns a loaded Accord sedan into such a luxury-car stand-in that it gives product planners in the Acura wing at headquarters as many fits as it does Honda's rivals.

But at Marysville, they care more about people and process than product. Associates are still talking about when company founder Soichiro Honda visited Marysville in 1989, shaking hands with everyone along the line. They tell the story to the new hires, just as they explain all the rest of the plant's history with pride. Japan doesn't build the Accord anymore. We do. It's ours.



GONE IN 108.4 SECONDS

When I asked to help assemble cars at Marysville, Honda was amenable, but only if I stated that no Accords were harmed in the making of this story. Shannon Freeman put her 27 years of experience to work guiding me along, preventing me from screwing up anything on a customer's car. But first she had to show me all the steps she takes for each Accord that passes through her station in need of a steering wheel, which she installs.

After first scanning a bar code on each car as it approaches, she plucks a wheel from a bin, scans its bar code, then pops two fasteners into a plastic liner under the hood as she moves toward the cockpit. She also grabs a seatbelt cover, a bolt, and the right and left sun visors from bins. Before she hops in the car, she torques the driver's seatbelt bolt with a wrench that's sitting on the seat. Then she snaps the cover in place.

Inside, she fishes the keys from the center console, turns on the ignition, and plugs an electronic test box into the OBD II port under the dash. While the box checks the electric power steering, turning the Accord's front wheels as it glides forward on the line, Freeman installs one of the visors. Then she pulls a tab off the steering column's

wiring harness, chucking it in a disposal bin before threading the wiring through the back of the wheel as she fits it onto the column.

It was about here that my brain went into overload the first time she demonstrated the process. And the second. And the third time, too. But Freeman still had to plug in the wiring connector, turn off the car, and hand-thread the bolt in the center of the steering wheel. Then hop out of the car, grab an automatic power tool, fit its fixture to the rim of the steering wheel, and tighten the bolt. Time to completion: 54.2 seconds, the same as every station in exterior assembly.

Freeman glided effortlessly through the progression with patient poise, explaining every step as she went. I could not jot them down in my notebook as fast.

Nor, as it turned out, could I perform half the steps in the time allotted, even after watching Freeman intently for 10 minutes. Only by paring my list of tasks and forcing her to act as my Sherpa (Where does the other visor go? Keys?) was I able to get my first steering wheel installed.

I rewarded myself with a break, to, um, take some more notes. Freeman goaded me into trying again, after which I announced my retirement from Marysville. No party was thrown in my honor, and for all I know, the two white sedans they let me touch were pulled from the line immediately afterward and sent to rework. —JS

A CALM IS NOT DESIRABLE
IN ANY SITUATION IN LIFE
ABIGAIL ADAMS



Cadillac

DARE GREATLY

THE CTS-V 6.2L SUPERCHARGED V8 ENGINE, 640 HP, AVAILABLE
RACE-INSPIRED RECARO® SEATS AND 200 MPH TOP SPEED ON THE
RACETRACK. ADD FINE-TUNED FURY TO YOUR LIFE. CADILLAC.COM/CTSV

MAZDA MX-5 MIATA

THINK DIFFERENT, DRIVE DIFFERENT

BY TONY QUIROGA

photography by SCOTT G. TOEPFER

HOW WE'D BUILD IT:

The Miata is a simple and sporty car, so ours would follow suit. We would start with the MX-5 Club version (\$29,420), which brings a sport-tuned suspension, limited-slip differential, and bigger wheels. We would of course specify the standard manual transmission. The only option we'd bother adding is Advanced Keyless Entry (\$130) because we don't want to have to reach into our pocket for the key. Grand total would be a steal at \$29,550.



ASSEMBLY PLANT: HIROSHIMA, JAPAN
OTHER MODELS: CX-5, CX-9

We understand the Mazda MX-5 Miata because it subscribes to our worldview. It's a manifesto of car enthusiasm in steel, glass, and rubber. Make it small. Make it light. Make it quick. Make it efficient. Make it affordable. Make it reliable. Make us smile.

There's a new Miata parked outside, exhaust ticking. It's the afterglow of a run up and down Angeles Crest Highway north of L.A., the City of Angels and the City of Miatas. If the car feels as if it were created for these roads, that's because its engineering sign-off happened here. Every brake application, throttle blip, snap downshift, and slalom toward the

SPECIFICATIONS

MAZDA MX-5 MIATA

VEHICLE TYPE: front-engine, rear-wheel-drive, 2-passenger, 2-door convertible
 BASE PRICE \$25,735-\$31,185
 ENGINE: DOHC 16-valve 2.0-liter Atkinson-capable inline-4, 155 hp, 148 lb-ft
 TRANSMISSIONS: 6-speed manual, 6-speed automatic with manual shifting mode
 CURB WEIGHT 2300-2350 lb
 EPA CITY/HWY 27/34-36 mpg





**“AN OBJECT LESSON IN VEHICLE
DYNAMICS, ONE OF THE BEST-
HANDLING CARS IN THE WORLD
FOR LESS THAN THE SALES TAX
ON A FERRARI.” -M.Duff**

apex is an invocation of joy. The Miata strings together corners like they're rosary beads. You might be tired at the end, but it'll be a happy kind of exhaustion.

The Miata isn't a numbers car, although 2309 pounds and a 5.9-second zero-to-60 time are impressive figures. Light steering effort hints at the low mass, and the feedback is as clear and uninterrupted as a landline call. Fling it into any corner and the Miata's body moves around more than those of modern sports cars. It reacts to your inputs by diving, squatting, and rolling. It's floppy and eager, like a puppy scurrying across a wood floor to lick your face.

And how could you not love its face? Restyled to look meaner and leaner, the Miata's design has finally purged its bogus British affectation. Sharp edges and lines fold over the machinery, while fenders punch outward. The headlights are knee-high; its beltline is more like a thighline. The view out of this two-seater is mostly bumpers and tires of other cars. Lesser drivers would feel vulnerable, but we're happy down here, even if we can't find the 12-volt outlet (it's by the passenger's left ankle).

With the top tucked away, our senses heighten. Smells roll in—dry grass, dusty pavement, the creaky Ford Aerostar that has finally pulled over to let us by. Vibrations course through the car. We've entered a Miata state of mind. Happiness washes over. The little roadster beneath us surges forward to the next corner. Amen.



ENVIRONMENTAL ENGINEERING MAZDA'S DAVE COLEMAN PUTS THE MIATA IN ITS PLACE

Dave Coleman, 42, is the North American engineering manager for the Miata, a job that gives him the authority to develop Miatas for the U.S. market. We recently met Coleman to drive Miatas, talk Miatas, and discuss the importance of canyon roads.

C/D: *What were your responsibilities on the MX-5?*

DC: I was responsible for the whole U.S. spec. From setting the targets for what the car needed, to following it through development, to helping get it fine-tuned and dialed-in for this market.

C/D: *What battles did you fight for the Miata?*

DC: At one point this car [the 2.0-liter] had a really

heavy flywheel. We had lots of gear-rattle noises in the NC [previous-gen] that we kind of accepted because the only alternative to the noise was to have a heavy flywheel. We'll go with having some noise. [Japan] really didn't want to have the gear noise, so they put a heavy flywheel in the car, and it just didn't respond right. It took this lightweight car and made it kind of feel heavy and clumsy. And it was way too late to be changing that thing, and we had to convince a lot of people to bend a lot of schedules to put together a development plan with no backups. Your backup plan is you have to go back to the heavy flywheel. But they managed, way beyond the last second, to come up with a new flywheel. It all gelled at the last second.

C/D: *What makes these roads important?*

DC: There are just hundreds and hundreds of miles of the most dynamic twisty roads up here [north of Los Angeles]. But these are incredibly good test roads because they are not only twisty, they're bumpy and

uneven and upset the car, and there are all sorts of complicated transitions. You have to have a car dialed-in really well for it to do well on roads this complex.

This is a really good second- or third-gear car. That's the magic of it. You can have a lot of fun without going that fast. This road we're on now [Little Tujunga Canyon Road] was really to secure this car's position as a Miata. This is the kind of road where Miatas have always been good.

C/D: *Where else did you go?*

DC: We also went over to Angeles Crest Highway, which is a much higher-speed, flowing road, and that's where we tested a Lotus Elise and Subaru BRZ that we were benchmarking. Those cars don't do well on these supertight roads, but they really come into their own on those higher-speed sweepers, and that's where the older Miatas would kind of fall apart. We kept bouncing back and forth on those roads, trying to get this car to stay true to itself on tight stuff but play with those guys on the fast stuff. -TQ



If you were to stroll through the Mazda 3 assembly plant in Hofu, Japan, it wouldn't be unusual to find a bamboo-and-paper shoji door in an engineer's locker. "It opens and slides without much effort," explains Hirotaka Takaya, doors development engineer. Nor should you be surprised to find a drawing of the anatomy of a human arm. "We determined which muscles are used to operate [the shift lever]," explains Takao Kijima, former MX-5 Miata program manager, "to balance the amount of strength needed." Kijima further suggests, "When the car and driver are in harmony, driving is fun."

"Harmony," as it happens, is not a bad descriptor for the Mazda 3. In this car, no single element overwhelms its essential character. It feels substantial, yet quick-witted. Its subassemblies all shake each others' hands. It responds to fingertip control. It is a car that assists its pilot in smooth driving.

So just thinking about pushing the shifter into first gear is seemingly sufficient to get the job done, and, if you so desire, you can make four upshifts without depressing the clutch. Jumping rudely in and out of the throttle produces no driveline snatch. And the steering feels as if it circulates on needle bearings submerged in Jergens lotion.

Of course, some of the 3's goodness can also be attributed to the company's Skyactiv program, which so far remains a confounding mystery to consumers and rightly so. In part, it's a version of simultaneous engineering that says, "The guy who designs the bolt will do so alongside—and with the advice of—the guy who designs the nut." But in practice, Skyactiv's mandate

MAZDA 3

A THOUSANDS - OF - PARTS HARMONY

BY JOHN PHILLIPS

photography by TOMOHIRO OHSUMI



ASSEMBLY PLANT: HOFU, JAPAN*
OTHER MODELS: 6
*Some 2.0-liter Mazda 3s are built in Salamanca, Mexico.

is to earn gains by fixing little, boring things that were previously not wholly in Mazda's cross hairs. The program might better have been called "We pick nits," although that makes for an unappetizing catchphrase.

One big Skyactiv victory has been the reduction of engine NVH, not by adding sound deadeners but by reducing friction. The more freely a device spins, in theory, the less racket it's likely to make. In Mazda's gas engines, for instance, Skyactiv has reportedly reaped a 54-percent reduction in valvetrain friction, a 74-percent increase in oil-pump efficiency, a 31-percent increase in water-pump efficiency, and 13 percent better breathing.

Mazda claims that Skyactiv also has the happy side effect of piquing curiosity. Says Masahiro Moro, an executive of Mazda Japan: "If something is strange, we don't turn away. We study it."

One thing that got studied was the manufacture of engine blocks. The 3's blocks previously passed through 45 machining processes requiring six hours. Now CNC machines do all 45 jobs at only three stations in 1.3 hours. It's a big deal when you're producing 150 to 200 Mazda 3s a day, as Hofu does.

It helps, too, that Ford has finally withdrawn its foot from Mazda's doorjamb. Mazda is back doing what it does best: building small cars (and great-driving cross-overs). No trucks or luxury sedans. Look what a carmaker can do when it focuses on the small stuff.

HOW WE'D BUILD IT:

Go directly to the s Grand Touring four-door hatchback, with manual six-speed transmission, 18-inch all-season tires, and 2.5-liter 184-hp engine. If you forgo everything else, you'll owe only \$26,265.

SPECIFICATIONS

MAZDA 3

VEHICLE TYPE: front-engine, front-wheel-drive, 5-passenger, 4-door sedan or hatchback
BASE PRICE \$18,665-\$26,265
ENGINES: DOHC 16-valve 2.0-liter Atkinson-capable inline-4, 155 hp, 150 lb-ft; DOHC 16-valve 2.5-liter Atkinson-capable inline-4, 184 hp, 185 lb-ft
TRANSMISSIONS: 6-speed manual, 6-speed automatic
CURB WEIGHT 2850-3100 lb
EPA CITY/HWY 25-30/35-41 mpg



P#0068

CAR AND DRIVER'S
10 BEST CARS FOR 2016
01 JAN / 20 SIXTEEN

PORSCHE BOXSTER AND CAYMAN





WEISSACH BORN AND BRED

BY EDDIE ALTERMAN

photography by CHARLIE MAGEE

CAR AND DRIVER'S
10 BEST CARS FOR 2016
01 JAN / 20 SIXTEEN

HOW WE'D BUILD IT:

Choose the GTS versions of the Boxster or the Cayman and Porsche does all the hard work for you. No need to worry about whether to get the Sport Chrono package, the sound symposer that pipes exhaust noise into the cabin, or the 20-inch wheels. Get 'em in GTS trim and you also get an additional 15 horsepower over the S models and an extra 7 pound-feet of torque. When you tally all the GTS extras, you save \$3000 over the same equipment fitted to an S, not to mention that power bump. Still, there's more to add, including the excellent Burmester audio system for a not-insubstantial \$6730 and Porsche Torque Vectoring for \$1320. Be careful, though, this gets to be a pricey exercise. Avoid the \$7400 Ceramic Composite Brakes (you're not Walter Röhrl) and the seatbelts in Yachting Blue for \$350 (you're not Judge Smalls). Total: \$86,830.



ASSEMBLY PLANT: ZUFFENHAUSEN, GERMANY*
OTHER MODELS: 911

*Cayman production will be transferred from Osnabrück, Germany, by August 2016.

From the vantage point of nearly 20 years, it's apparent that this little car, born in open-top Boxster form, rescued the company. It was no mere entry-level Porsche, no *unter-911*; it may have been co-developed with the 996 to save money, but it emerged as something wholly unto itself. The original Boxster was a high-proof distillation of the company's history and point of view, and its excellence elevated the brand at a time when the economic waters were up to Porsche's chest. It certainly allowed Porsche to start charging ridiculous sums for its 911, a car that outdrove the Boxster only by fierce and concerted intramural manipulation. And it made Porsche's profitable forays into SUVs defensible. How could a straight-faced person say the company had lost its way when it was still so obsessively consumed with its mid-engined sports car?

The legitimacy of the Boxster, and the Cayman coupe that followed it nine years later, derived from Porsche's R&D temple in Weissach. These cars drew on

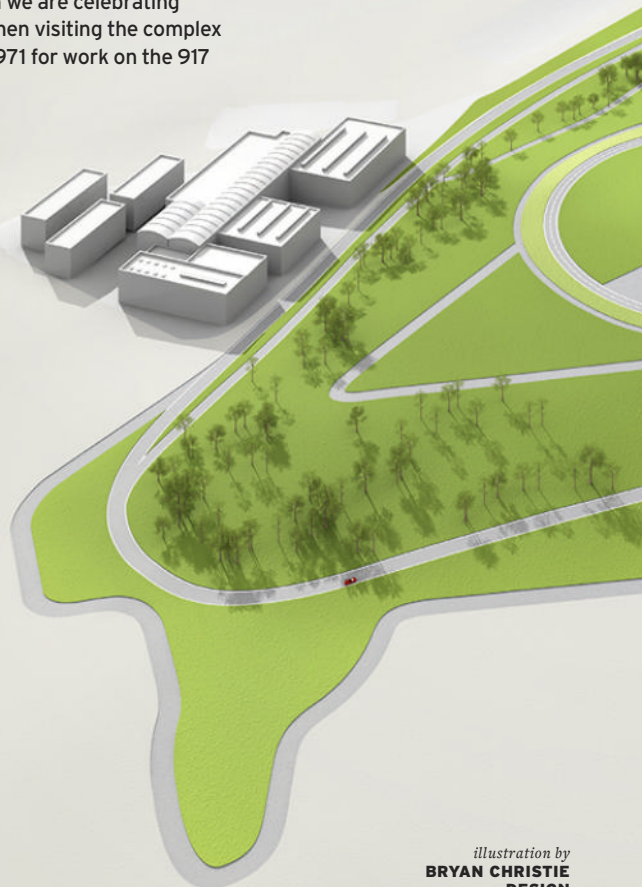
THE SECRET NEVER LEAVES THE GATE

On October 16, 1961, Ferry Porsche, at the controls of a large bulldozer, broke ground on a 94-acre parcel of land that would prove immeasurably fertile for his company. This plot—some 20 miles northwest of Stuttgart, bordering the town of Weissach—began service as a three-ringed skidpad but evolved into the place where Porsche does most of its research and development work. No other carmaker groups all its disciplines, from concept planning to dynamic testing, together in one complex like this. And though this assertion is hard to prove, the interaction of designers, engineers, aerodynamicists, and executives at Weissach is why Porsche's cars emerge from their factories in such cohesive shape.

At Weissach, small groups developed everything from the original 911 to the Le Mans-winning 917 to the Boxster/Cayman we are celebrating here. When visiting the complex in late 1971 for work on the 917

Can-Am car, racer/engineer Mark Donohue wrote that it was like General Motors, except "they had five racing engineers instead of five thousand." You may recall that the resulting 917/30 was so dominant in Can-Am that it effectively shut down the series. That's what you call workplace efficiency.

Last year, Porsche opened three new buildings at Weissach—a concept-car construction facility, an aero-acoustics wind tunnel, and a unit housing the electrical- and electronic-development departments, previously scattered across 12 buildings on the site. Weissach is like an old house whose owner keeps adding new wings while maintaining the place's original spirit. Beyond all the flat engines and nuanced suspension systems, Weissach may be Porsche's real secret weapon. —EA



SPECIFICATIONS PORSCHE BOXSTER AND CAYMAN

VEHICLE TYPE: mid-engine, rear-wheel-drive, 2-passenger, 2-door coupe or convertible
BASE PRICE \$53,095–\$76,195
ENGINES: DOHC 24-valve 2.7-liter flat-six, 265 or 275 hp, 207 or 213 lb-ft; DOHC 24-valve 3.4-liter flat-six, 315–340 hp, 266–280 lb-ft
TRANSMISSIONS: 6-speed manual, 7-speed dual-clutch automatic with manual shifting mode
CURB WEIGHT 3050–3150 lb
EPA CITY/HWY 19–22/26–32 mpg

illustration by
BRYAN CHRISTIE
DESIGN

**“AFTER DRIVING THIS YOU
WON’T BE ABLE TO DRIVE
ANYTHING ELSE FOR
A MONTH. THIS CAR WILL
RUIN YOU.” –T.Quiroga**

Weissach’s legacy of engineering experimentation to make them as faithful to their drivers’ intentions as they were to Porsche’s way of thinking. Though suspended by struts all around for the sake of packaging and cost, its rear suspen-

sion used the so-called Weissach link, a lateral arm first developed for the 928 that worked to control wheel deflection and keep the tire’s contact patch stable. The architecture itself took lessons from another Weissach project, the mid-

engined 914, though most of these were of the “don’t-do-it-this-way” variety. Such as: Don’t forget about rigidity. The Boxster’s high level of structural stiffness (higher still on the Cayman) lets the suspension do the work it was intended to do—i.e., provide an agreeable and composed ride but also impart the handling sensitivity and sharpness that are hallmarks of great sports cars.

And what a great pair they are. Few cars have steering this alive, brakes this stout, or damping this nuanced. There is no other mid-engined machine that pairs the Boxster/Cayman’s instantaneous directional changes with such progressive breakaway behavior. No other cars transition so immediately out of turns, either, their slalom-skier bodies effortlessly setting up for the next corner.

These are sports-car fundamentals rooted in Weissach soil, and they are always tangible in the cars we are lauding here, even at low speeds. The inherent rightness of Porsche’s mid-engined lineup hasn’t faded with age; if anything, it’s intensified. And this is where the cars break ties with the brand’s icon, the 911. Purists will tell you that the 911 lost something when it got power-hungry, that its escalating output and weight gains marred its responsiveness and controllability. They’ll say that an early car with the long-wheelbase chassis and the 2.2-liter flat-six is the perfect 911. Exactly no one says anything similar about the Boxster or Cayman. These cars improve with power. Yes, the early, least potent versions were great, but they are not the fully realized ones. Maybe today’s models aren’t, either, as nimble and flexible and powerful and non-turbocharged as they are. Maybe the fully realized ones are a long way off. Or maybe they’re being developed right now, somewhere inside Weissach’s outbuildings.



**CANDIDATES
FOR THE
REWORK LOT**

Lacking refinement:



**ALFA ROMEO 4C
SPIDER**

*“It’s not done.
Send it back.”*

— T.Quiroga



**CHEVROLET
CORVETTE
STINGRAY**

*“Goes like stink, but
stinks like plastic.”*

— D.G.Johnson



FIAT 500X

*“Doesn’t drive enough
like a car.”*

— D.Sherman



HONDA HR-V

*“Does drive like a
car—a bad one.”*

— D.Sherman



**VOLKSWAGEN
JETTA 1.4T**

*“Feels like a Chinese
knockoff of the Golf.”*

— J.Sabatini

**Aesthetically
challenged:**



**MINI COOPER
HARDTOP
JOHN COOPER
WORKS**

“A parody of itself.”

— M.Duff



NISSAN MAXIMA SR

*“From the inside you
almost forget how
insane this car looks.”*

— J.Gall



SCION iA

*“So much less attractive
than the Mazda 2
hatch we were supposed
to get.”*

— D.G.Johnson

TESLA MODEL S 70/70D

YOUR USER EXPERIENCE AWAITS

BY ERIC TINGWALL

photography by JAMES LIPMAN

HOW WE'D BUILD IT:

We would choose the four-wheel-drive Model S 70D. To this we would add Autopilot semi-autonomous capability (\$2500) because our commutes are long and boring. We'd opt for the Smart Air Suspension (\$2500) for ride-height adjustability. We'd replace the flat standard seats with tan next-generation seats (\$2500). And they would be heated, too, thanks to the Subzero Weather package (\$1000). Slap on some Midnight Silver Metallic paint (\$1000) and we arrive at a total of \$85,700.



ASSEMBLY PLANT: FREMONT, CALIFORNIA
OTHER MODELS: MODEL X

Forget for a moment that the Tesla Model S's fuel tank is an aluminum box packed with thousands of battery cells. Ignore the electric motors and Elon Musk's Captain Planet sermons. Really, just try to wipe what you know about the car from your mind. Even in this context, the Model S still points a spotlight on the auto industry's complacency.

To drive a Tesla Model S is to reexamine how a car and its driver should interact. The door handles stow flush with the sheetmetal

until they glide out to meet your hand as you approach. The stereo and climate system power on the moment you open the door. Who needs a headlight switch when the car is smart enough to know the difference between day and dusk, sun and rain?

Pared to its essentials, the cabin glows with an elegantly modern simplicity. We bristled at touch screens until Tesla's sharp, 17-inch pane rendered buttons large enough to use at speed on a crumbling interstate. Periodically, the Model S learns new tricks via a software update it had downloaded while you were away.

But Tesla didn't just reimagine how a key should work or the role of software in a car. As traditional dealers erect roadblocks for Tesla's factory-owned stores, Model S buyers should celebrate the ability to escape the brick-and-mortar experience altogether. It is as easy to buy a car on Tesla's website as it is to shop Amazon. Configure the car you want, make a \$2500 deposit, and your Tesla arrives a couple of months later.

The Model S is the only electric vehicle with the driving range to make sense in American suburbs or on our backbreaking commutes. The 70-kWh models—in either rear- or four-wheel drive—slip under our \$80,000 base-price ceiling and cover more than 200 miles per charge. All electric cars come with the convenience of refueling at home, but only Tesla makes long-distance travel possible with its nationwide network of free, high-voltage superchargers.

The Model S is also the rare electric vehicle that embraces our

CLOUD-BASED COMMUTING

Tesla's Silicon Valley mentality means the cars are never quite finished, even years after they've left the factory. The company's most significant software updates, shown here, mean a Model S purchased in 2012 is a different car today.

JUNE 2012

First Model S deliveries.

OCTOBER 9, 2012

The Model S now creeps forward when the driver lifts off the brake. A mobile app allows owners to remotely monitor charging, vent windows, lock and unlock doors, and precool or preheat the cabin.

NOVEMBER 30, 2012

Tesla adds voice commands. The door handles now automatically extend as the driver approaches the vehicle with the key fob. A new "range" driving mode reduces the amount of energy consumed by the climate control.

JUNE 18, 2013

The navigation system now displays Supercharger locations and previously visited chargers. When directed to preheat or precool the cabin, the car will use energy from the charger rather than the battery.

MARCH 24, 2014

Tesla adds hill-start assist.

SEPTEMBER 11, 2014

The air-suspension system now remembers locations where the driver previously raised the car and increases the ride height automatically on approach. Owners can use voice commands to report bugs to Tesla, sending a snapshot of their car's status and screens to the home office. Navigation directions now take traffic into consideration, and a new in-car calendar syncs with a phone to display upcoming appointments.

DECEMBER 7, 2014

Holding the trunk button on the key fob opens the charge port.

JANUARY 8, 2015

Adaptive cruise control, automatic high-beams, and forward-collision warning activated on cars fitted with Tesla's Autopilot hardware.

MARCH 28, 2015

Blind-spot warning and automatic emergency braking enabled on Autopilot-equipped cars. A valet mode limits the car to 107 horses and 70 mph when active. A new route planner suggests charging stops on long trips and warns when the car is out of range of chargers.

APRIL 10, 2015

Top speed of 85D models rises to 155 mph while the zero-to-60 drops from 5.2 seconds to 4.4.

OCTOBER 14, 2015

Tesla activates additional Autopilot features, including a self-steering function and automated parallel parking. Tesla redesigns the interfaces for the gauge cluster and touch screen and adds a brake-hold system.

SPECIFICATIONS

TESLA MODEL S 70/70D

VEHICLE TYPE: rear- or front-and-rear-motor, rear- or 4-wheel-drive, 5- or 7-passenger, 4- or 5-door hatchback
BASE PRICE \$71,200-\$76,200
MOTORS: AC induction, 315 hp, 325 lb-ft; 2 AC induction, 328 hp, 387 lb-ft
TRANSMISSION: 1-speed direct drive
CURB WEIGHT 4400-4600 lb
EPA CITY/HWY 88-101/90-102 MPGe

most basic philosophy: Driving should be engaging. The car steers, corners, and rides with a competence that seems perfected over decades of focused suspension development rather than a few short years as a Silicon Valley startup. The 70D accelerates in near silence with the fury of a red-line clutch dump. It springs off the line with 387 pound-feet of instantaneous torque and follows a seam-

less, shift-free trajectory to triple-digit speeds. Lift off the accelerator to harvest electrons and sail to a stop without ever touching the friction brakes. You learn to drive it with one pedal, using and recapturing electricity with the pace of traffic and the flow of the road. After a week piloting a Model S, it feels strange to drive anything else.

We live in a time where choosing among an Audi, a BMW, and a

Mercedes can feel like picking from French vanilla, natural vanilla, or extra-creamy vanilla. Electric propulsion threatens to make cars even more homogenized, and yet Tesla has perfected the art of making the intangibles palpable. It's the same approach that makes an Apple iThing so much more desirable than a thing from Nokia. With the Model S, Tesla has advanced the electric car from a compromised penalty box into something fun, fast, and desirable. What Musk figured out is that car buyers will always be willing to pay for performance and style, no matter what form they might take.

DIG - A - FACTORY

This past October, a photographer from the *Reno Gazette-Journal* was arrested after an altercation with guards at Tesla's Gigafactory. We've spared you the trouble, and the overnight companionship, with this pic.



“STILL THE FUTURE AS SEEN
FROM 2012.” -M.Duff

VOLKSWAGEN GOLF/GTI/GOLF R

THE BUSINESS OF VOLKSWAGEN IS GOLF

BY MIKE DUFF

photography by JOHN WYCHERLEY

HOW WE'D BUILD IT:

The GTI delivers the best value of the Golf range. The S trim is the only one that includes the Clark Plaid seats, so that's the obvious starting point. We'd gladly spend an extra \$600 for a pair of rear doors, but we'll skip the automatic transmission in favor of the six-speed manual. Adding \$1495 to the bill for the Performance package would get us the electronically controlled differential and 10 more horsepower, and that's where we'd stand pat, at \$27,910.



ASSEMBLY PLANT: PUEBLA, MEXICO*

OTHER MODELS: BEETLE, JETTA

*Golf R is assembled in Wolfsburg, Germany.

It is easier to forgive an enemy than a friend. We understand if the inclusion of the Volkswagen Golf in this year's 10Best, its 10th in a row, causes surprise, incredulity, or even the sort of sputtering indignation normally only displayed by raging lieutenants in buddy-cop movies. We fully acknowledge that this is a controversial decision and the mailroom is on standby and all vacation for

our Backfires team has been canceled. But it is nevertheless the right one.

This has not been a good year for Volkswagen, any more than it has been for peace in the Middle East. We now know that Clean Diesel was, like David Hasselhoff's music career, a cruel German joke. The emissions-cheating TDI engine scandal will haunt the brand for years and will almost certainly cost VW many billions in restitution. Affected owners have lost more than the mileage and performance the eventual fix will likely cost; they've also misplaced the moral superiority that came from being part of the solution. As smog goes up, smugness falls.

But we still love the Golf, damn it. The gasoline-powered derivatives are fully deserving of their place on our altar of greatness. As Volkswagen makes the Golf, so the Golf makes Volkswagen. This

THE VENDING MACHINE

At VW's Autostadt, this car tower stores up to 400 vehicles fresh from the Wolfsburg, Germany, factory and fetches them for waiting customers.



supremely engineered line of two- and four-door hatchbacks remains the crown jewel of the modular MQB architecture that underpins the group's global volume. By our reckoning, no fewer than 21 distinct cars are built from this supremely versatile "matrix," sold around the world wearing Audi, Škoda, and SEAT badges as well as VW roundels. But none of these is better than the Golf.

It's a true world car, one that raises the average by the simple math of its popularity and excellence. And the very ubiquity of the platform it sits on is critical to its success. This is what happens when

SPECIFICATIONS VOLKSWAGEN GOLF

VEHICLE TYPE: front-engine, front- or 4-wheel-drive,
5-passenger, 2- or 4-door hatchback
BASE PRICE \$19,315-\$36,470
ENGINES: turbocharged and intercooled DOHC 16-valve
1.8-liter inline-4, 170 hp, 184 or 199 lb-ft; turbocharged and
intercooled DOHC 16-valve 2.0-liter inline-4, 210 or 220
hp, 258 lb-ft; turbocharged and intercooled DOHC 16-valve
2.0-liter inline-4, 292 hp, 280 lb-ft
TRANSMISSIONS: 5-speed manual, 6-speed manual, 6-speed
automatic with manual shifting mode, 6-speed dual-clutch
automatic with manual shifting mode
CURB WEIGHT 2900-3350 lb
EPA CITY/HWY 22-25/30-37 mpg

“RARELY REVEALS THAT IT’S FRONT-WHEEL DRIVE.” —D.Sherman



PLATFORMER

MQB was first used with the third-generation Audi A3 hatchback, introduced in Europe in 2012, and has since spread to underpin most of the VW Group's compact and mid-size offerings. (The Jetta is a notable exception.) MQB is not a platform in the old sense, as the only hard and fast similarity is between the pedal box and the front axle line, allowing for a fully modular powertrain strategy. Volkswagen has said that MQB will last for several product cycles and up to 40 models will ultimately be built using it. —MD

Current model breakdown:

AUDI

- A3: 2-door hatch, 4-door hatch, 4-door sedan, convertible
- TT: coupe, convertible

SEAT

- Leon: 2-door hatch, 4-door hatch, wagon

ŠKODA

- Octavia: 4-door hatch, wagon
- Superb: 4-door hatch, wagon

VOLKSWAGEN

- Golf: 2-door hatch, 4-door hatch, wagon
- Golf Sportsvan: wagon
- Passat (European market only): 4-door sedan, wagon
- Tiguan: small SUV
- Touran: minivan

you can spread billions in development costs across millions of sales. Unlike many Volkswagens of old—and some of today—the Golf works as well in the U.S. as it does anywhere else, as happy in Waco or Wilmington as it is back home in Wolfsburg.

Much as we love the higher reaches of the range, it's the basic Golf hatch that remains the best example of the benefits wrought from this globalized platform. There are bigger cars for the money, and faster ones, too. But none that comes close to the Golf's relentless Teutonic precision. It is assembled to a standard that makes some luxury cars feel shoddy. The biggest weakness of its base engine, a 170-hp 1.8-liter turbo four, is that it is

not the GTI's 2.0-liter turbo four.

The German love of hierarchy holds true as you ascend the range, each slightly more expensive variant offering enough extras to justify the price step. The GTI combines the base Golf's impressive comfort and quality with the sharpness of a true sporting machine. If you spend \$1495 more for the Performance package, you might not be able to feel the difference in its 220 horses over the stock 210, but you will notice the extra traction delivered by the electronically controlled limited-slip differential. Before you know it, you'll be trying to marshal the funds to purchase the \$36,470 Golf R, with 292 horsepower, four-wheel drive, and supercar-baiting real-world abilities.

For all the comedic charm of nouns like *Schadenfreude*, *Flugplatz*, and—of course—*Ausfahrt*, German is not the most poetic of languages. But, for us, *Modularer Querbaukasten* (modular transverse matrix, or MQB in VW-speak) is poetry to rival Goethe's. Some aspects may have been untrue, but on the whole, it's still beautiful. ■

CANDIDATES FOR THE REWORK LOT

Lacking excitement:



AUDI TT COUPE/ROADSTER

"The gauge cluster is the most exciting thing about this car, which is as sterile as an alcohol swab."

—E.Johnson



CADILLAC ATS-V COUPE/SEDAN

"Stellar chassis, aggressive aesthetics, catapult power, the ATS has everything but personality."

—D.G.Johnson



HYUNDAI SONATA HYBRID

"You can't earn a 10Best spot with miles per gallon."

—D.Sherman



MERCEDES-BENZ C450 AMG

"The methadone of AMG cars."

—T.Quiroga



SCION iM

"A convincing argument for killing the brand."

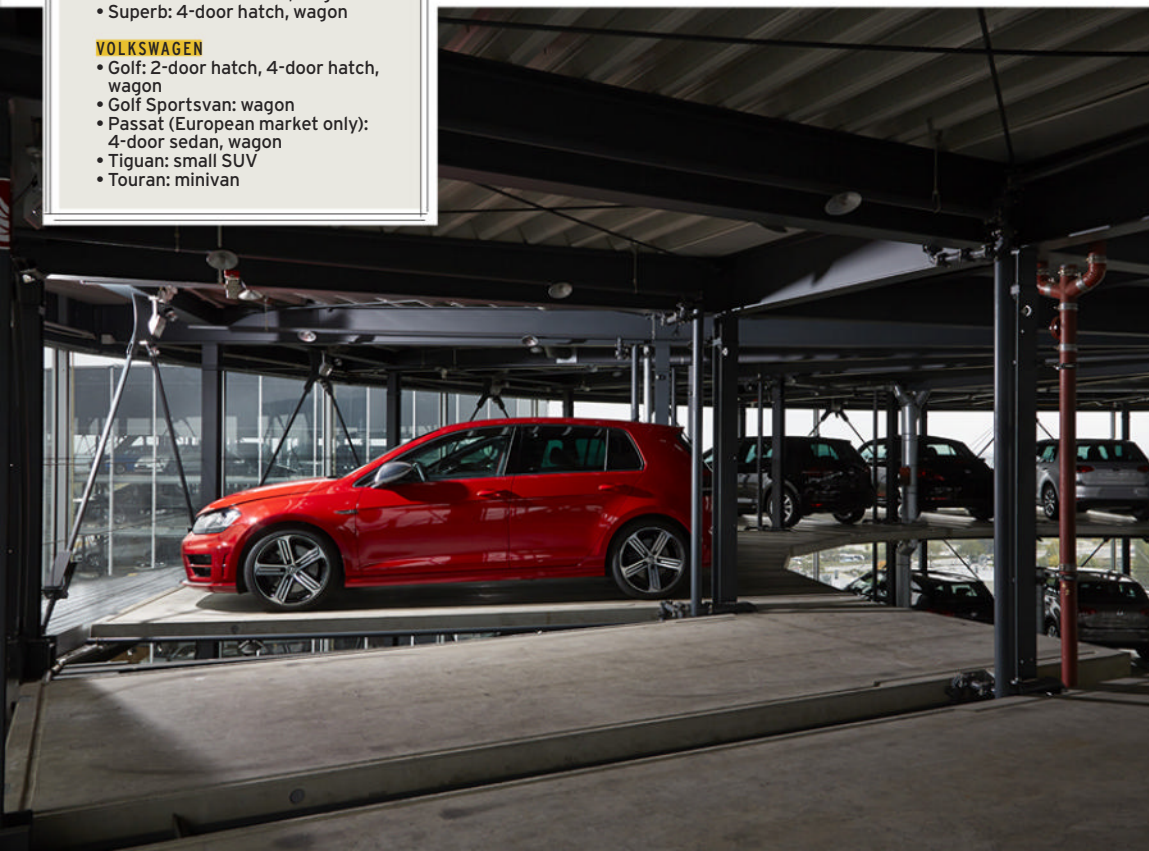
—J.Gall



TOYOTA CAMRY XSE 2.5/SE HYBRID

"Hates going fast; tolerates the posted speed."

—A.Wendler





“You bet

I have

WeatherTech®”

Accessories Available for

Acura · Audi · BMW · Buick · Cadillac · Chevrolet · Chrysler · Dodge · Ferrari · Ford · GMC · Honda · Hummer · Hyundai · Infiniti · Isuzu · Jeep · Kia · Land Rover · Lexus · Lincoln · Maserati · Mazda · Mercedes-Benz · Mercury · Mini · Mitsubishi · Nissan · Oldsmobile · Plymouth · Pontiac · Porsche · Saab · Saturn · Scion · Subaru · Suzuki · Toyota · Volkswagen · Volvo · and more!

Order Now: 800-441-6287



American Customers
WeatherTech.com



Canadian Customers
WeatherTech.ca



European Customers
WeatherTechEurope.com



WeatherTech[®]
American Manufacturing *Done Right!*

Laser Measured FloorLiner™

Accurately and completely
lines the interior carpet

Material provides soft touch top, rigid
core strength and bottom surface friction

Available in Black, Tan and Grey



All-Weather Floor Mats

Deeply sculpted channels designed to
trap water, road salt, mud and sand

Will not curl, crack or harden
regardless of temperature

Available in Black, Tan and Grey
for virtually any vehicle



Accessories Available for

Acura · Audi · BMW · Buick · Cadillac · Chevrolet · Chrysler · Dodge · Ferrari · Ford · GMC · Honda · Hummer · Hyundai · Infiniti
Isuzu · Jeep · Kia · Land Rover · Lexus · Lincoln · Maserati · Mazda · Mercedes-Benz · Mercury · Mini · Mitsubishi · Nissan
Oldsmobile · Plymouth · Pontiac · Porsche · Saab · Saturn · Scion · Subaru · Suzuki · Toyota · Volkswagen · Volvo · and more!

Order Now: **800-441-6287**



American Customers
WeatherTech.com



Canadian Customers
WeatherTech.ca



European Customers
WeatherTechEurope.com

Cargo/Trunk Liner



Digitally designed for each application

Complete trunk and cargo area protection

Remains flexible under temperature extremes

Available in Black, Tan and Grey

No-Drill MudFlap



Mounts-In-Minutes™

Protect your vehicle's most vulnerable rust area

Installs without tire/wheel removal

No drilling into the vehicle's fragile metal surface

Available for trucks and SUVs

Custom Built to
Follow the Contours
of Your Vehicle

QuickTurn™ Fastening
System Requires No Drilling



WeatherTech®
American Manufacturing *Done Right!*

In-Channel Side Window Deflectors

No exterior tape needed

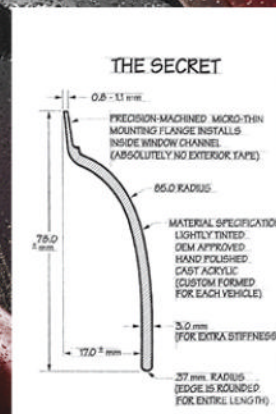
Reduces wind noise and allows interior heat to escape

Easy to Install



Light and Dark Tint

Designed and Engineered in USA - Handcrafted in Germany



TechLiner®

Flexible and durable

No messy sprays or drilling needed

100% recyclable, odorless material

Chemical and UV resistant

TechLiner® Works Well Under Rigid Bed Liners to Protect Against Paint Wear



Accessories Available for

Acura · Audi · BMW · Buick · Cadillac · Chevrolet · Chrysler · Dodge · Ferrari · Ford · GMC · Honda · Hummer · Hyundai · Infiniti · Isuzu · Jeep · Kia · Land Rover · Lexus · Lincoln · Maserati · Mazda · Mercedes-Benz · Mercury · Mini · Mitsubishi · Nissan · Oldsmobile · Plymouth · Pontiac · Porsche · Saab · Saturn · Scion · Subaru · Suzuki · Toyota · Volkswagen · Volvo · and more!

Order Now: 800-441-6287



American Customers
WeatherTech.com



Canadian Customers
WeatherTech.ca



European Customers
WeatherTechEurope.com

CargoTech®

Cargo Containment System

Couples a durable plastic "fence" with a super-grippy underside to keep cargo stable

Excellent for cargo area organization

Works with WeatherTech® Cargo Liner or existing vehicle carpet or flooring



BumpStep®

Hitch Mounted Bumper Protection

Protect your bumper from minor accidents

Fits standard 2" receiver hitch

Safely stand on the step (up to 300lbs.) for everyday tasks



WeatherTech®
American Manufacturing *Done Right!*



ACURA'S NEW ANDROID
SAMURAI QUIETLY
DESTROYS TRACKS.

by Aaron Robinson / photography by Marc Urbano

MATHLETE

2017 ACURA NSX





Should Acura even have this car? It's a question we first posed with our preview of the NSX last April.

Ailing Acura strikes us as a brand in need of reinvention from the bottom up, starting with a new Integra, the car that the people have crowned the real keeper of Acura's flame. Instead, Honda's luxury brand is starting its long journey back to relevance from the top, with a hybrid supercar that will sell for more than \$150,000. It'll be a tall poppy in a showroom where the next-priciest vehicle starts at \$51,870, but it's too late to dig up old arguments about priorities. We've finally moved past the drawings and the concepts, past that aborted baby-blue prototype with the wrong engine turned the wrong way, and on to what the aviation industry calls the flight article. This is it, the real deal, a drivable NSX with a key that has been placed in our hands. So we'll put aside the academic critique and just go torture pavement.

What we're about to drive is a distillation of Honda's inner feelings at this moment. After some dark years of uncertainty, the company is ruminating on past glories, on Marlboro McLarens with Ayrton and Alain, racing bikes with oval pistons, and absurdly exquisite lawn equipment. Honda wants to be spoken of with awe again, to show the world that it's back as a technology and performance powerhouse ready to both amaze the world and till its flower beds.

The aborted prototype with the transverse V-6 from the Honda Odyssey minivan died in mid-2012 because it couldn't deliver amazement, and a crash program to reinvent the NSX ensued. The 2017 NSX, developed mainly in Ohio by a small group

that has come to think of itself as a family, is a four-wheel-drive hybrid-electric knee to the pants of the world's fanciest exotics. Its creators sincerely hope you like it, as do their loved ones, whom they haven't seen in two years.

This is a prime example of filter-down technology. The layout of the three electric motors onboard—two on the front axle and a third between the twin-turbo V-6 and the nine-speed dual-clutch gearbox—recalls that of the late, great \$847,975 Porsche 918 Spyder, promising many of its benefits for a fraction of the price. Those benefits include rapid torque vectoring, continuous thrust assist to smooth over turbo lag and torque changes during upshifts, a modicum of fuel efficiency,



↑ Above: The spoiler is part of an optional carbon-fiber package still in development.
Right: Buttresses echo those of Ford's new GT.

and, if desired, silent operation for brief periods. Someday, this stuff will be in a Civic, but for now at least, the price tag has slid under \$200,000.

Acura's sculptors passed on the virile flair typical of the Italians, as well as the utopian futurism of the BMW i8, preferring instead a somewhat conventional, menacing angularity. It's not an angry-looking car, but it does appear determined. With its wide stance and long wheelbase, the snub-nosed body has unmistakable mid-engine proportions, and it invites a stroll around to investigate its many ducts and air holes. The flaring nostrils up front hide the radiators and the A/C condenser, while the side ducts gulp air for the intercoolers and engine intakes. The original 1991 NSX had flaplike door handles, and this one uses flush grab-sticks that angle out when needed, as on an Aston Martin.

The hood opens to a "hot box" of aluminum chassis members and equipment, the

“AN NSX PASSING BY AT FULL
THROTTLE IS A WHOOSH,
THE ENGINE A DISTANT VOICE
IN THE WILDERNESS.”





single, four-cubic-foot trunk residing behind the engine. Squat down in back and you'll notice a cluster of what looks like Honda Fit exhaust pipes. Unusually small for a car expected to hit 60 mph in less than three seconds, the four pipes are your first hint that the new NSX is not like other sports cars.

The 3.5-liter dry-sump V-6 has racing heredity in its odd, 75-degree V angle, and it fires up with an automatic rev-zing now typical of high-strung machines. But it's not a howling yap meant to turn heads in three counties, just a muffled throat-clearing heard mainly through the sound tubes plumbed from the intake plenum into the cabin. The Japanese culture emphasizes politeness. The demure NSX faithfully reflects that ethos.

To wit: The four drive modes start with "quiet," which allows you to sneak away in silence up to 40 mph if you're easy on the gas pedal. Silence "can be really, really cool in a supercar," says the NSX's ebullient chief engineer, Ted Klaus, who behaved at the launch as if several anvils had recently been lifted from his back. "We definitely have a different opinion than Ferrari." Definitely.

Sport is the mild-mannered default mode (though you can change the default), with steering that is a little overboosted. Acura wants the NSX to be everyday usable, a commendable goal but one that shouldn't mean steering so light that the car changes

▼ SPECIFICATIONS

VEHICLE TYPE: mid-engine, front- and mid-motors, 4-wheel-drive, 2-passenger, 2-door coupe
BASE PRICE (est) \$155,000

ENGINE TYPE: twin-turbocharged and intercooled DOHC 24-valve V-6, aluminum block and heads, port and direct fuel injection

DISPLACEMENT 213 cu in, 3493 cc
POWER 500 hp @ 7500 rpm
TORQUE 406 lb-ft @ 2000 rpm

FRONT MOTORS: two permanent-magnet synchronous AC, 36 hp, 54 lb-ft (each)

MID MOTOR: permanent-magnet synchronous AC, 50 hp, 109 lb-ft

TOTAL SYSTEM POWER 573 hp

TRANSMISSIONS: F: 1-speed direct drive;

M: 9-speed dual-clutch automatic with manual shifting mode

DIMENSIONS
WHEELBASE 103.5 in
LENGTH 176.0 in
WIDTH 76.4 in
HEIGHT 47.8 in
PASSENGER VOLUME 55 cu ft
CARGO VOLUME 4 cu ft
CURB WEIGHT 3800 lb

PERFORMANCE (C/D EST)
ZERO TO 60 MPH 2.9 sec
ZERO TO 100 MPH 7.6 sec
1/4-MILE 11.1 sec
TOP SPEED 191 mph

FUEL ECONOMY (C/D EST)
EPA CITY/HWY 19/26 mpg

and 305/30ZR-20 in back. It's the commuter tire, with only middling dry-road grip but the promise of wet-weather traction and some decent longevity. If you are nailing it on the open road, you'll find the limit a tad too quickly as the front end fights for grip. Fit the optional Michelin Pilot Sport Cup 2s, almost the same meats as on the Porsche 911 GT3, and the grip becomes that of cured epoxy. But you'll be lucky to get 15,000 miles out of a set.

Things get interesting when you turn the large console dial to sport-plus. The electronic tachometer rotates so that red-line moves to the 2 o'clock position—peak engine horsepower is at 7500 rpm—and the steering weight finally becomes appropriate to a car with 573 combined horsepower. You can lap a track in sport-plus and get a taste of the NSX's capabilities, but only a taste on the Continentals, which amplify the understeer tuned in for safety. In sport-plus, the stability-control system still hovers, straightening this and nudging that and cleaning up your imperfect lines.

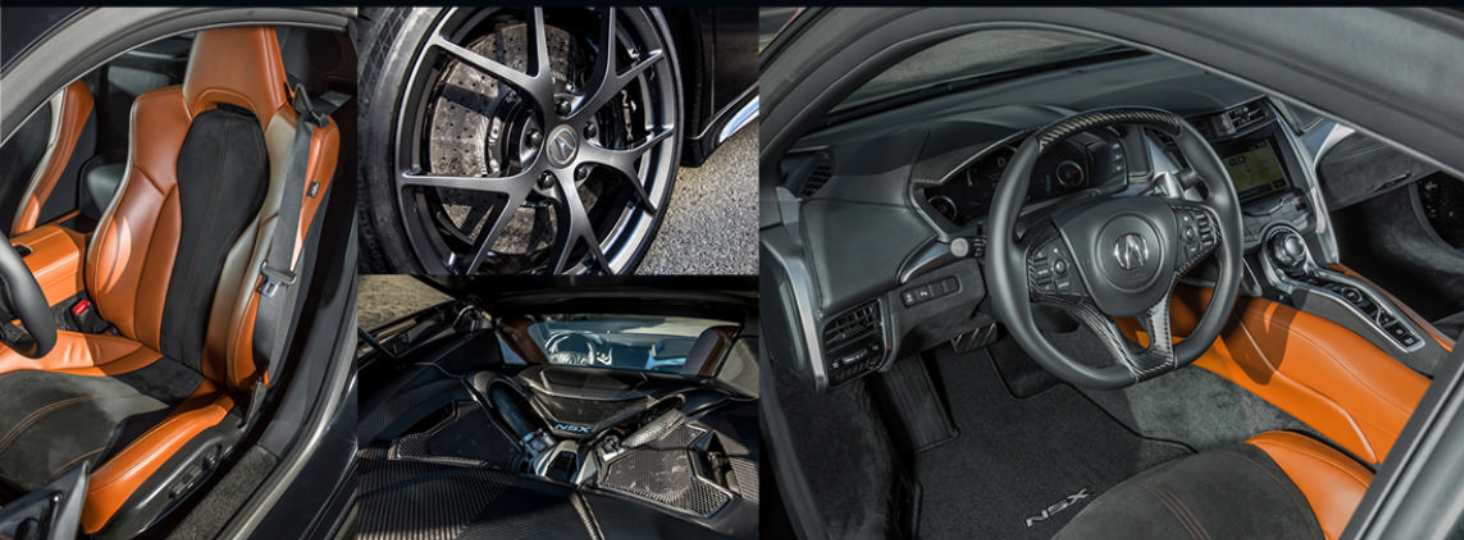
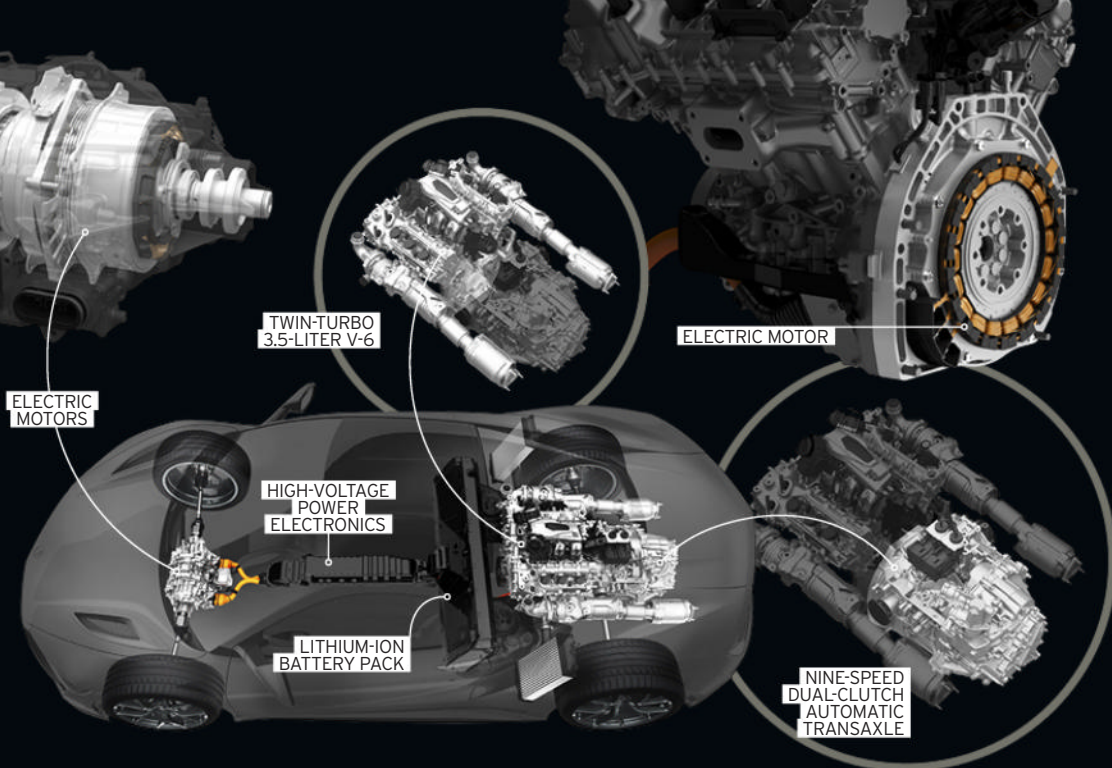
Hold the console dial several seconds to call up track mode and you finally see the vision, the car that Honda dreamed of. On the Michelin tires, it is ferocious, leaping at corners with steering so tightly wound that you vector the car by palm impulse. The brake pedal is just a rheostat to command—by wire—the electrohydraulic brakes, but it's given a more organic feel by a hydraulic pressure simulator. The net effect is a firm, highly effective pedal, and one that is very sensitive to minute changes in pressure. Iron discs will be standard, while the car we drove had

direction over every freeway bump and dip. You can't set steering heft or shift speed individually, so you get what the engineers give you in each mode. Sport mode quickly speeds the many-ratio transmission to its top gear for fuel economy, which is expected to peak in the mid-20s and average around 22 mpg once the EPA numbers are established.

The base tire is a Continental ContiSportContact 5P, sized 245/35ZR-19 in front

UNDER THE SKIN

Like the BMW i8 and Porsche 918 Spyder, the Acura NSX blends electric and combustion power to provide hardy acceleration and a few miles of emissions-free driving. An AC motor drives each front wheel. Rear propulsion is supplied by a twin-turbo V-6 and a third motor teamed with a nine-speed dual-clutch transaxle.



↑ Clockwise from left: Well-crafted seats; iron rotors will be available; nearly storage-free cockpit; Predator-face-style mesh engine cover.

the optional carbon-ceramic rotors.

On the run, the NSX's computers take data from its many sensors and work the hardware like a coxswain on a rowing team. The front motors alternately thrust through their planetary gearsets or drag in regen mode, while the rear tires also push or brake as needed to yaw the car in accordance with the driver's whims. Exiting a corner, you want to get on it early to put the front's side-by-side motors into full tractor mode to help pull the heavy NSX out with startling haste. The upshifts are heard but barely felt, the acceleration curve hardly slackening as the front motors power the car through the gearchanges and the rear motor impels the V-6 as the

boost builds back to its 15.2-psi peak.

It's a seamless operation and a vision of a future when all cars will be bionic. It's also much too muted. The precision thrum of the V-6 piped into the cabin lacks a guttural snarl, and it's even more disappointing for bystanders. An NSX passing by at full throttle is a whoosh of mostly tire hiss and displaced air, the engine a distant voice in the wilderness. We don't mind that the steering wheel, comparable in feel and feedback to a Porsche 911's, doesn't jump in your hands, but the NSX needs more drama.

Another issue: Rather than offer a series of escalating modes that increase the driver's freedom, as, say, on the Chevy Corvette Z06, the NSX's staircase is designed for outcomes, or to make the car go ever faster. In track mode, you can't slide around because sliding is slower. The car inter-

venes with corrections that make it straighten up and fly right. Faster lap times, yes, but also not as much fun. You can shut off the stability control entirely, but then you risk a wall encounter. Besides desperately needing a door bin to hold your cellphone, the NSX needs another mode, call it "track-plus," that lets the driver make mistakes and look into the abyss but that acts to prevent disaster. With it, the NSX would be a better learning tool.

The overall impression is that of a company that hasn't built a sports car in a while, cautiously feeling its way with a complicated new machine produced by a rushed, bass-ackwards development program. It has the essentials; what it needs can mostly be added with software. The on-sale date isn't until spring, so there's still time to make the NSX of our dreams. ■

THE TALE OF THE TWO TOWERS

BMW AND MERCEDES BATTLE
TO SEE WHO CAN GET HIGHER.

BY DANIEL PUND / PHOTOGRAPHY BY ANDREW TRAHAN



BMW X6 M

PRICE > \$114,795
POWER > 567 hp
TORQUE > 553 lb-ft
WEIGHT > 5202 lb
0-60 MPH > 3.7 sec

A red Mercedes-AMG GLE63 S Coupe is parked on a gravel surface in front of a stone tower and a large tree. The car is shown from a rear three-quarter view. The stone tower is a tall, weathered structure with several windows and a small balcony. A large, leafy tree stands to the right of the tower. The sky is blue with scattered white clouds. A concrete wall with graffiti is in the foreground, and a chain-link fence is behind the car.

**MERCEDES-AMG
GLE63 S COUPE**

PRICE > \$118,610
POWER > 577 hp
TORQUE > 561 lb-ft
WEIGHT > 5397 lb
0-60 MPH > 3.9 sec

GATHER 'ROUND THE FIRE, FOLKS, AND LET UNCLE CAR AND DRIVER TELL YOU A LITTLE STORY.

Some people might call it a fable or a fairy tale, but there ain't fairies in this tale or brownies or sprites, not even a wisecracking woodland gnome. Where were we? Right, way back in the mists of time known as the 1920s, before interstate highways and chairs that give massages, there was a land known as the Irish Hills.

Now, that name is what fancier folks might call a misnomer, because these hills weren't in Ireland and, truth be told, the hills really weren't much in the way of hills, either. No, those hills were in Michigan, where any



→ Opposite top: Only 12 cases of beer will fit in the X6 M's cargo hold, barely enough alcohol to make you forget how odd this vehicle is. Opposite and below: Fussiness abounds inside the BMW.

old lump is called a hill. Along U.S. Route 12, once the trail that connected Detroit and Chicago, there lived a farmer named Edward Kelly whose land included part, but not all, of Brighton Hill. In about 1924, the Michigan Observation Company (MOC) decided it would build an observation tower on that hill, because, well, because Netflix hadn't yet been invented. The evil MOC decided to cash in on the tourists with this roadside attraction. The good Mr. Kelly was not at all pleased, but the MOC built its 50-foot tower anyway, mere feet from his property line.

So Kelly built his own damn tower, of similar design, right next to it. But Kelly's was 60 feet tall. It would come to be known as the Spite Tower. *[Are we going to be mentioning the vehicles at any point in this comparison test?—Ed.]*

Well, that wouldn't do at all, said the MOC. It was not about to lose a measuring contest to Kelly and added 14 feet to the top of its tower. Possibly you saw this coming, but Kelly then added four feet to the top of his tower, putting it even with the MOC's.

It wasn't until the MOC threatened to tear down its tower and build a much taller steel structure that Kelly called a truce. And the people rejoiced in this battle of the towers. Then the interstate came and sucked all the tourists away from the Irish Hills and its cheesy attractions. The towers were eventually joined and ringed by a half-bit miniature-golf course. They now sit, stained and boarded up with their observation decks removed, a last-ditch effort to try to save them from the wrecking ball by making them nominally weatherproof until the current owner could raise the \$300,000 it would take to repair them.

We're not implying that the BMW X6 M and the Mercedes-AMG GLE63 S Coupe are in any way like those two towers. For one, both vehicles were, in our testing, watertight and structurally sound. To see the towers as an allegory for these two hot-rodded coupe-ish SUV thingamabobs would be to imply that German car-makers are in a constant and sometimes futile measuring contest, caring only about one-upping each other. And that can't be true because, um, these two vehicles are both made in the United States.

Mercedes started this whole "four-door coupe" silliness with its CLS sedan, and was followed quickly by BMW and its two four-



BMW X6 M

■ Test-track performance that defies physics.

■ Fussy controls, uninspiring synthetic soundtrack, can't relax.

■ If you're looking to dominate the two-and-a-half-ton class at track day, this is the vehicle for you.

door coupes. BMW was the first to take the basic concept to new heights of absurdity with its X6. And it was Mercedes that fired back with the large bar of soap known as the GLE Coupe. And look at where this has gotten us: Testing 5200-plus-pound performance vehicles that ride on massive, sticky summer tires and provide precious little of the utility of an SUV with precious little of the fun of a proper performance car. It's a cautionary tale.

But here they are nonetheless. A second-generation snub-nosed BMW X6 M, which pumps out 567 horsepower from its twin-turbocharged 4.4-liter V-8, performs astonishing feats on the test track and looks from the rear-three-quarters view like a rat with no tail.

Fresh this year is the GLE Coupe, a GLE SUV made less practical. Predictably, its 5.5-liter twin-turbo V-8 makes 10 more horsepower than the X6 M's engine, because, nyah, nyah, nyah, ours is bigger.



Viewed directly from the rear, it looks like a sad robot with a chrome unibrow.

So what, pray-tell, constitutes a win in this segment of \$100K-plus high-performance, low-utility parade floats? Good question. Let's find out together.

2. BMW X6 M

Look at our performance-test results for the BMW. Go ahead, we'll wait...

Right? How insane are those numbers? The BMW might have lost this comparison test, but it certainly didn't lose it on the test track. This 5202-pound chunk of automotive fashion hammers its way to 60 mph in an improbable 3.7 seconds. It stops from 70 mph in just 152 feet. And it circles the skidpad with a ridiculous 1.01 g's of grip. For perspective, all of the above numbers are better than those achieved by the 3613-pound BMW M3 DCT.

If the guiding criteria for a win here rested on absurd achievements of absurdity, the X6 M would win hands down. BMW didn't just teach an elephant to dance; the company also strapped roller skates to its feet and mounted JATO rockets to its ass.

That the beefy X6 M can carry fewer beer cases in its cargo hold (behind the rear seats) than an A4-based Audi Allroad Quattro is no great demerit, since the even-beefier Mercedes can only match the Allroad's beer-carrying space.

So why does the BMW lose? While we'd like to say that the most illogical vehicle—the one that best embodies the most devil-may-

VEHICLE	BMW X6 M	MERCEDES-AMG GLE63 S COUPE
BASE PRICE	\$103,195	\$110,225
PRICE AS TESTED	\$114,795	\$118,610
DIMENSIONS		
LENGTH	193.8 inches	193.6 inches
WIDTH	78.3 inches	78.9 inches
HEIGHT	66.5 inches	67.7 inches
WHEELBASE	115.5 inches	114.8 inches
FRONT TRACK	65.6 inches	65.2 inches
REAR TRACK	65.6 inches	67.1 inches
INTERIOR VOLUME	F: 56 cubic feet R: 45 cubic feet	F: 52 cubic feet* R: 46 cubic feet*
CARGO BEHIND	F: 60 cubic feet R: 27 cubic feet	F: 61 cubic feet R: 23 cubic feet
TOWING		
MAX	6000 pounds	7198 pounds
AS TESTED	6000 pounds	7198 pounds
POWERTRAIN		
ENGINE	twin-turbocharged DOHC 32-valve V-8 268 cu in (4395 cc)	twin-turbocharged DOHC 32-valve V-8 333 cu in (5461 cc)
POWER HP @ RPM	567 @ 6500	577 @ 5500
TORQUE LB-FT @ RPM	553 @ 2200	561 @ 1750
REDLINE/FUEL CUTOFF	7000/7000 rpm	6350/6400 rpm
LB PER HP	9.2	9.4
DRIVELINE	8-speed automatic	7-speed automatic
TRANSMISSION	all	all
DRIVEN WHEELS	all	all
GEAR RATIO:1/	1 5.00/5.2/36	1 4.38/5.5/35
MPH PER 1000 RPM/	2 3.20/8.2/57	2 2.86/8.5/54
MAX MPH	3 2.14/12.2/85	3 1.92/12.6/81
	4 1.72/15.3/107	4 1.37/17.7/113
	5 1.31/20.0/140	5 1.00/24.3/156
	6 1.00/26.2/160	6 0.82/29.6/160
	7 0.82/31.9/160	7 0.73/33.2/160
	8 0.64/41.0/150	
AXLE RATIO:1	3.15	3.69
CHASSIS		
SUSPENSION	F: multilink, coil springs, anti-roll bar R: multilink, air springs, anti-roll bar	F: control arms, air springs, anti-roll bar R: multilink, air springs, anti-roll bar
BRAKES	F: 15.6-inch vented, cross-drilled disc R: 15.2-inch vented, cross-drilled disc	F: 15.4-inch vented, cross-drilled, grooved disc R: 13.6-inch vented, cross-drilled, grooved disc
STABILITY CONTROL	fully defeatable, competition mode, launch control	partially defeatable
TIRES	Michelin Pilot Super Sport F: 285/35ZR-21 105Y R: 325/30ZR-21 108Y	Continental ContiSportContact 5P F: 285/40ZR-22 (106Y) R: 325/35ZR-22 (110Y)

C/D TEST RESULTS

ACCELERATION		
0-30 MPH	1.4 sec	1.5 sec
0-60 MPH	3.7 sec	3.9 sec
0-100 MPH	9.0 sec	9.8 sec
0-150 MPH	24.5 sec	27.1 sec
1/4-MILE @ MPH	12.1 sec @ 115	12.5 sec @ 112
ROLLING START,		
5-60 MPH	4.4 sec	4.5 sec
TOP GEAR, 30-50 MPH	2.6 sec	2.5 sec
TOP GEAR, 50-70 MPH	3.0 sec	3.2 sec
TOP SPEED	160 mph (gov ltd)	160 mph (gov ltd)*
CHASSIS		
BRAKING, 70-0 MPH	152 feet	159 feet
ROADHOLDING,		
300-FT-DIA SKIDPAD	1.01 g	0.95 g†
610-FT SLALOM	45.2 mph	44.6 mph†
WEIGHT		
CURB	5202 pounds	5397 pounds
%FRONT/%REAR	51.6/48.4	54.7/45.3
CG HEIGHT	25.0	26.5
FUEL		
TANK	22.5 gallons	24.6 gallons
RATING	93 octane	91 octane
EPA CITY/HWY	14/19 mpg	14/18 mpg
C/D 100-MILE TRIP	15 mpg	13 mpg
PRACTICAL STOWAGE		
BEER CASES,		
SEATS UP/FOLDED	12/30	14/36
LENGTH OF PIPE	121.5 inches	122.5 inches
LARGEST FLAT PANEL,		
LENGTH X WIDTH	71.3 x 43.0 inches	68.5 x 40.8 inches
SOUND LEVEL		
IDLE	48 dBA	46 dBA
FULL THROTTLE	88 dBA	83 dBA
70-MPH CRUISE	70 dBA	68 dBA

*C/D estimated. †Stability-control inhibited.

tested in Chelsea, Michigan, by **K.C. COLWELL**

care flaunting of practicality and sense—should win, we can't. The BMW loses because it's a less-good day-to-day vehicle than the Mercedes.

The BMW's rear seats are cramped, forcing average-to-tall rear-seat riders to tilt their heads uncomfortably and assume a legs-spread posture, as if birthing the front-seat passengers. The BMW's ride is admirably compliant on most surfaces in comfort mode. But, in sport and sport-plus modes, the X6 M on lumpy pavement becomes a bucking bronco, its enormous Michelin Pilot Super Sport tires (sized 285/35ZR-21 in front and 325/30ZR-21 in the rear) yanking the steering wheel as it follows the prevailing terrain. From the remote, high-mounted seat, the driver is left to feel as if he or she is just a passenger along for the head-tossing ride. Mind you, on a smooth test track the BMW conquers our slalom quicker and with more predictable handling than the Mercedes. But that's the crux of the problem with the X6 M: It feels as if it were designed to be more of a handling engineer's proving-ground toy than a vehicle for the road.

The X6 M's seat and driving position are less comfortable than the GLE's, despite a near-endless variety of adjustments. The BMW's interior is such a bewildering assemblage of panels and textures and controls that you'd think it came out of a modern Cadillac. The instrument panel strata (from bottom to top) are black leather with tan stitching, tan leather with tan stitching, a strip of semi-gloss aluminum, shiny piano-black plastic, glossy carbon fiber, four pieces of black leather with tan stitching, and a piece of black leather with black stitching.

Its engine, mighty powerhouse that it is, doesn't sound very inspiring. Instead, it just sounds strange, garnering descriptions ranging from "a V-10 with an exhaust leak" to "BMW's synthetic exhaust note, version 2.0." And while the engine makes plenty of thrust once up to full boil, the power pauses and surges before it gets there in a way unbecoming of a BMW.

These quibbles, however, do not diminish BMW's otherworldly accomplishment developing the X6 M into a numbers-generating monster. And we appreciate that BMW delivered our test car in full peacock plumage, covered as it is in a sort of electric-teal paint and wearing medium-blue painted calipers. It makes a helluva statement. And as soon as we figure out what that statement is, we will let you know.

1. MERCEDES-AMG GLE63 S COUPE

During at least part of our exhaustive testing of this new and terribly misnamed "coupe," an adorable little ladybug rode along with us. It would appear on the dash looking all children's-book cute for a leg of our journey, and then it would reappear on the windshield header for the next leg. We can only guess that it felt at home in the beetle-shaped GLE, or that it thought it had found in the Mercedes its god.



MERCEDES-AMG GLE63 S COUPE

➤ Sounds spectacular, plenty quick enough, comfortable.
 ➤ Looks not spectacular, absurd lift-over height, "less insane" remains a variety of insane.
 ➤ The gentleman's high-performance coupe-ified SUV thing.

Whatever the case, features editor Jeff Sabatini, a man who knows from luck, deemed the bug's presence auspicious. And that line of unreasonable reasoning makes as much sense as either of these utes, so...

It's true that the heavyweight GLE63 S is not as quick as the X6 M. (Unlike other AMG models, no non-S version of the GLE63 is offered because, why would it be?) Nor does it stop in as short a distance. And its Continental summer tires can't out-stick the BMW'sMichelins on the skidpad, despite their identical section widths. But at 3.9 seconds to 60, the 5397-pound GLE63 S Coupe is as quick as the stonking new Chevrolet Camaro SS. It circles the skidpad with as much grip, 0.95 g, as a new Ford Mustang GT with the Performance package. And it stops from 70 mph in 159 feet.

Those numbers are legit, certainly for a vehicle with a roof 67.7 inches off the ground. But it's the GLE63's comportment



on the road, when it's not at the absolute limit, that gives it the win over the X6 M. There's just something about the AMG philosophy that is better suited to big-baller performance vehicles.

For one, the company produces the biggest, beefiest exhaust notes in the business. Turbos? Yeah, the Mercedes has them, but they don't muffle the thunder. We judged the exhaust to be best in comfort mode. In the sport-plus setting, the GLE63 does its best Jaguar F-type imitation (although an octave lower) by spitting and popping in response to a lifted throttle. It's of sufficient violence to make us imagine the GLE's exhaust splitting at its seams. And it farts excitedly on upshifts of the seven-speed automatic. That's cool, if you're into that sort of thing.

Have a look at the top-gear acceleration results for the two vehicles. From 30 to 50 mph, the Mercedes is actually quicker than the BMW. Okay, it's only by a tenth of a second. But, it implies greater powertrain flexibility. In day-to-day driving, the AMG feels at once more alert and willing than the M—and also less strained.

There is less of a noticeable difference between comfort and sport than in the BMW, but in any of the settings, the Mercedes provides a more pliant ride. It is unperturbed by undulating pavement and still provides a pretty amazing resistance to body roll. In this respect, the GLE63 doesn't feel as if it's trying as hard to feel sporty as the X6 M, but it achieves performance nearly as high.

Our track tester complained about the GLE63's wayward tail during our slalom test, but we never felt it on the road. Below the limits, the GLE feels eager to turn in a way that belies its 114.8-inch wheelbase.

← Mercedes covers a sensibly designed interior in a not-sensible wrapper. The GLE63's comfy and supportive front seats will even give you a massage, albeit a feeble one.

★ FINAL RESULTS

093

RANK	12		
	Mercedes-AMG GLE63 S	BMW X6 M	
Maximum points available			
VEHICLE			
DRIVER COMFORT	10	9	8
ERGONOMICS	10	8	6
REAR-SEAT COMFORT	5	4	3
REAR-SEAT SPACE*	5	4	4
CARGO SPACE*	5	5	5
TOWING CAPACITY*	5	5	3
FEATURES/AMENITIES*	10	10	9
FIT AND FINISH	10	9	8
INTERIOR STYLING	10	9	7
EXTERIOR STYLING	10	5	6
REBATES/EXTRAS*	5	0	1
AS-TESTED PRICE*	20	19	20
SUBTOTAL	105	87	80
POWERTRAIN			
1/4-MILE ACCELERATION*	20	18	20
FLEXIBILITY*	5	4	3
FUEL ECONOMY*	10	8	10
ENGINE NVH	10	10	8
TRANSMISSION	10	9	8
SUBTOTAL	55	49	49
CHASSIS			
PERFORMANCE*	20	18	20
STEERING FEEL	10	8	8
BRAKE FEEL	10	7	8
HANDLING	10	7	8
RIDE	10	9	7
SUBTOTAL	60	49	51
EXPERIENCE			
FUN TO DRIVE	25	15	16
GRAND TOTAL	245	200	196

*These objective scores are calculated from the vehicle's dimensions, capacities, rebates and extras, and/or test results.

Shell
V-Power
NITRO+
Premium Gasoline
The Official Fuel of
CAR AND DRIVER

In place of the BMW's visually cacophonous interior, the Mercedes' cabin is calm and well thought out. The front seats are comfy, with good lateral support. Its back seat is roomier than the BMW's, and the seat bottoms provide great leg support.

We think the Mercedes looks a bit dumpy on the outside. Passersby just seemed confused by the thing once their eyes made their way back to the truncated rear. And the height of the cargo-hold opening is a back strain waiting to happen.

Still, Mercedes' Spite Tower is the taller of the two for now. Or was BMW's the Spite Tower? Either way, in this competition, there's no truce on the horizon. ■

WINNERS

SOME WHO WON, SOME WHO LOST, AND A FEW WHO SHOULD SHUT THEIR NO_x TRAPS.

by AARON ROBINSON

illustrations by SEAN McCABE



WINNER

The Pope

The 266th leader of the Roman Catholic Church touched down in America in September, and, as the papal Chevy Beretta needed a jump, he hopped into a new Fiat 500L, evoking Mother Teresa's embrace of the lepers. Being a man of renowned modesty, Pope Francis spurned the standard-issue Secret Service black SUV for the humble 30-mpg 500L, which was flown from the Vatican in its own 747.



WINNER

Car Sales

Numbers just out at press time showed the U.S. light-vehicle market on track to beat its record of 17.4 million sales, set back in 2000. Since then, the market has weathered and shrugged off the successive calamities of 9/11, the Iraq war, the financial crisis, and Oprah's retirement, and was last seen heading toward 18 million.



LOSER

Pirelli

Storied Italian tiremaker Pirelli has been sold to a Chinese chemical company. ChemChina executive Gin Ra Tso said the high-performance P Zero would immediately change its name to the P.F. Chang's rich. Meanwhile, Volvo, another Chinese brand, announced a new factory in South Carolina, a state that China also plans to buy and rename Great Patriotic Workers Camp No. 34.



LOSER

Jeremy Clarkson

BBC's *Top Gear* jumped into the proverbial 55-gallon drum of smallpox in March when lead presenter Jeremy Clarkson, he of the stiletto tongue and head of teased

lichen, slugged a producer for neglecting to order him a steak. Because nothing proves insanity more than fighting over British food, the BBC fired him, and Clarkson and his cohorts were forced to take massive, gluttonous raises by signing with Amazon Prime.



THE GOOGLE AUTONOMOUS KOALA BEAR SEEN HERE SCIENTING THE SHIT OUT OF THINGS.



WINNER

Silicon Valley

Apple has all but announced that it will build the DeVille d'Elegance of automated electric cars, with an accompanying watch to inform you, via its 256-color graphic interface, whenever you are #trending. Its prime competitor may be Google, which is planning to "science the shit" out of the problem of vehicular automation. Both companies have been stealing staff from nearby Tesla, which says that they were employees fired for dressing like Elon Musk.

LOSER

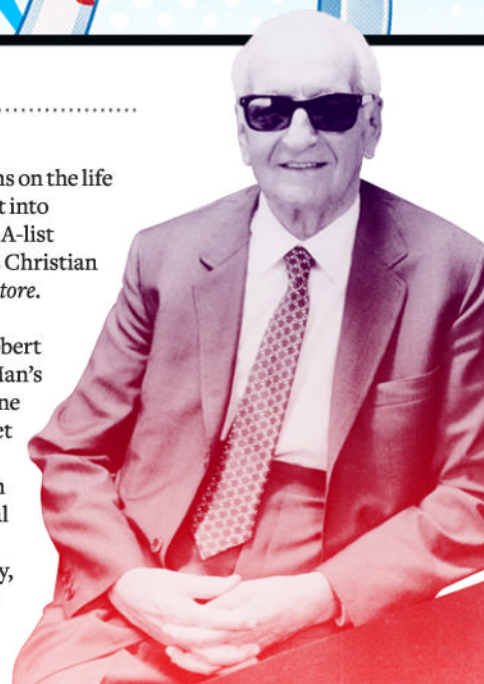
The People's Car

VW changed its slogan to "Fahrfromtrühen" after admitting to cheating on EPA emissions tests with its TDI diesels, blaming the software cheat on a small group of engineers sent by ISIS. The news caused a brooming of executives and a loss of trust by TDI fans, who are now embracing urea as a bong additive.

WINNER

Enzo Ferrari

Two Hollywood films on the life of Enzo Ferrari went into production starring A-list actors. One features Christian Bale as *Il Commendatore*. Another version of Ferrari's life puts Robert De Niro in the Old Man's chair. One grave scene leaked to the internet shows De Niro as Enzo emerging from Niki Lauda's hospital room and saying: "The f--- is that? Hey, who likes it medium rare? I'm kidding! I'm kidding!"



LOSER

OxyClean

Toyota's highest-ranking female and one of its few non-Japanese senior execs, chief communications officer Julie Hamp, spent 20 days in the pokey over the summer for illegally importing oxycodone painkillers from the States.

Eventually, Hamp resigned and the charges were dropped, though rumors of right-wing ties to the police funneled speculation that she was the victim of resurgent Japanese xenophobia. Speaking from the steps of the new General Hideki Tojo police headquarters, officials denied any connection.

096

01.2016

caranddriver

. feature



WINNER

Ford GT

After offering "seven or eight figures" to lure Carroll Shelby away from his current gig of being dead, Ford has proceeded anyway with the revival of its historic Le Mans effort. Before the megabucks Ford GT supercar hits dealerships as a 2017 model, Chip Ganassi Racing will take it back to the circuit that is world famous for cold rain falling on \$15 crepes. Applications to purchase a GT will be accepted only from those with genetic ties to Dan Gurney, a proven ability to levitate, or current owners of Ford Thunderbird Turbo Coupes. Should you not snag one of the 250 examples the company plans to build annually, fret not, as Ford also will market the car as the Lincoln MKFU.



WINNER

Route 29 Batman

Lenny B. Robinson was Batman, as far as it goes for anyone who knew him. The well-off purveyor of a successful Maryland cleaning business, Robinson's hobby was donning his bat mask and cape and roaring off in his reproduction Batmobile to delight sick children in hospitals. Dubbed the Route 29 Batman, Robinson, 51, was a fixture in the pediatric wards near his suburban Baltimore home until one night last August when his Batmobile broke down. Another motorist struck the car and killed Robinson as he checked the engine. Hundreds of mourners in bat gear turned out to wish Godspeed to this righteous Dark Knight.

◀ Left: The real Caped Crusader. Right: Just some dude with painted-on eyebrows.

SEEN HERE: AN OUTLANDISHLY STYLED FORD-BASED RIDE FOR A MAN WHO WEARS HEADGEAR. ALSO, THE BATMOBILE.



LOSER

The Batmobile

Speaking of the Caped Crusader, attorneys crusading for DC Comics managed to copyright the original Batmobile last September. The 1966 version from the cheeseball TV show starring Adam West was a George Barris custom based on the 1955 Lincoln Futura show car. A few accurate replicas have been built, some by defendant Mark

Towle, who sold them for about \$90,000 from his Gotham Garage in Southern California. They can no longer be produced without permission, so after trying his hand at replica Jim Rockford Firebirds and copycat Subaru Bajas, Towle has started transforming old C4 Corvettes into fully licensed copies of Speed Racer's Mach 5. ■



Yutaka Katayama, 105, known worldwide as Mr. K. and the father of the Datsun 240Z.

Denise McCluggage, 88, racer, skier, scribe, pioneer, and eyewitness to much of what we call the golden age.

Dick Guldstrand, 87, racer and hot rodder, otherwise known as Mr. Corvette.

Erik "On the Roof" Carlsson, 86, the world's first international rally star and the roller of many Saabs.

Ernie Hemmings, 88, founder of the classic-car bible, *Hemmings Motor News*.

François Michelin, 88, grandson of Michelin founder Edouard Michelin, and the company head from 1959 to 2002.

Kirk Kerkorian, 98, a Las Vegas mogul, and at various times owner of large shares of Detroit's Big Three.

Justin Wilson, 37, U.K.-born IndyCar pilot and former F1 driver who was regarded as one of the nicest men in the paddock.

Buddy Baker, 74, NASCAR great and the first driver to go more than 200 mph on a closed course.

Iconic Cars

The experts at **Car and Driver**, who have tested every version of the **Corvette** and every model of **Porsche**, have created two stunning retrospectives celebrating the **past and present** of these incredible cars. Featuring sensational photography throughout.



AVAILABLE AS E-BOOKS

To download, visit
[www.rosettabooks.com/
 iconic-cars-ebooks](http://www.rosettabooks.com/iconic-cars-ebooks)

CAR AND DRIVER RosettaBooks®

Makes **Glass** Invisible!

NEW!

Water Spot Remover
 Removes water spots without scratching glass. Makes glass invisible!

Invisible Glass
 Premium Glass Cleaner
 Makes Glass Invisible!
 Tint Safe

Clean & Repel
 Glass Cleaner + Rain Repellent

Invisible Glass
 Premium Glass Cleaner
 Makes Glass Invisible!

Streak-Free Guaranteed!

Find America's #1 selling auto glass cleaner at

meijer
 TARGET

NAPA **LOWE'S** **AutoZone** **Walmart**

PEPBOYS AUTO **DOLLAR GENERAL** **Advance Auto Parts** **O'Reilly AUTO PARTS**

InvisibleGlass.com

BMW & MINI parts



- Free shipping over \$150 (most orders)
- Free DIY video guides
- Free color catalogs

BAVARIAN
autosport

BMW since 1974. MINI since 2002.

800.535.2002 | BavAuto.com



Revolutionizing tire buying since 1979®

YOU GOT THIS

Thank You, Winter Tires

#thinkingabouttires



Exclusive ICE RINK Test Results

On the track, on the road, in the snow, or at the rink — our test results help you find the tire that's right for you! Access complete test reports or watch the videos to see the results for yourself!



www.tirerack.com/wintertestresults

OVER 8,000 Independent Recommended Installers

It's easy to find one near your home or office and your order can be shipped directly to an installer location from one of our seven strategically located distribution centers.

www.tirerack.com/installer



BRIDGESTONE



BLIZZAK™ DM-V2™

NEW

Light Truck/SUV Studless Ice & Snow

Pickups, Crossover Vehicles and SUVs

BLIZZAK™ WS80™

Studless Ice & Snow

Coupes, Sedans, Minivans and Crossovers



Bridgestone's newest adaptive NanoPro-Tech Multicell compound remains flexible in below-freezing conditions and wicks water off the road to combat slipping on packed snow and ice, while bite particles act as microscopic studs that deliver more grip and improve braking on glare ice.*

*compared to Blizzak WS70 and DM-V1



Circumferential and Lateral Grooves help channel water, slush and snow away

3-D Zig-Zag Sipes upgrade traction in snow and on ice

BLIZZAK™ LM-32™

Performance Winter / Snow

Sports Cars, Sporty Coupes and Performance Sedans

Featuring a directional tread design comprised of stepped independent tread blocks employing Lamellen sipes, Blizzak LM-32 tires combine hydroplaning resistance on wet and slush-covered roads with enhanced traction in snow and on ice. H-, V- or W-Speed Rated.



For sizes and pricing visit tirerack.com/bridgestone



THE RIGHT TIRE AT THE RIGHT PRICE

OVER 500 MODELS FROM 17 MANUFACTURERS



TIRE REBATES AND SPECIAL OFFERS

Below are a few of the special offers available this month. See them all at www.tirerack.com/specials
To find out about special offers in the future, sign up for our emails at www.tirerack.com/email

SCORE
MAIL-IN REBATES UP TO

\$80

With the purchase of a set of four select Goodyear® tires.

Offer Valid 10-1-15 to 12-31-15

GOODYEAR
MORE DRIVEN

MICHELIN

GET A

\$70

MASTERCARD® REWARD CARD AFTER SUBMISSION

when you buy any set of four new MICHELIN® passenger or light truck tires.

VALID 11/16/15 - 12/13/15

PIRELLI

Get

\$60

WITH A PURCHASE OF FOUR QUALIFYING PIRELLI® SCORPION™ TIRES FOR YOUR SUV, CUV OR PICK-UP BY VISA® PREPAID CARD VIA MAIL-IN REBATE.

SCORPION™

Offer Valid
August 28 - October 6, 2015



BOLT-ON CONVENIENCE

Our Tire & Wheel Packages Include:

- Free scratchless mounting and Hunter™ Road Force balancing
- All necessary hardware



Build one at
www.tirerack.com/packages



Continental 
The Future in Motion



WinterContact™ SI

Studless Ice & Snow

NEW

Developed for coupes, sedans, minivans and cross-overs, the WinterContact SI features Continental's PolarPlus Technology.



**POLARPLUS+
TECHNOLOGY**

PolarPlus Technology incorporates +Silane additives to enhance traction on snow-covered and icy roads by allowing the tread compound to stay pliable when temperatures consistently fall below 45° Fahrenheit.

Directional tread design

blends dry road handling with foul-weather traction.

Base-of-the-groove ridges

provide additional 3-dimensional snow-biting edges to improve braking traction in deep snow.

High-density multi-angled zigzag sipes

increase the number of the tread surface's snow biting edges to enhance wet road and wintertime traction.



WinterContact SI tires meet the industry's severe snow service requirements and are branded with the mountain/snowflake symbol.

**For up-to-date pricing and availability,
shop by vehicle at www.tirerack.com/continental**





WINTER TIRES

Functional Footwear. For Your Vehicle.

**FIND THE
RIGHT WINTER TIRE
FOR THE CONDITIONS YOU DRIVE IN**



Call our sales specialists or shop by vehicle at www.tirerack.com/winter



READY-TO-BOLT-ON WINTER PACKAGES!

Tire Rack's Winter Tire & Wheel Packages make changing to winter tires easy and efficient. These high quality, vehicle-specific fitments arrive ready to bolt on your vehicle.

Packages include free scratchless mounting and free Hunter Road Force™ balancing. Plus, all necessary hardware is included at no additional cost!



SAMPLE PACKAGES

Build Your Own at www.tirerack.com/snow



'16 Toyota Corolla S
195/65R-15 General AltiMAX Arctic
15x6.5 MSW Type 14



'15 Dodge Charger RWD SE
235/55R-18 Bridgestone Blizzak DM-V2
18x8 Sport Edition KV5



'16 Audi A6 2.0T Quattro
225/55R-17 Bridgestone Blizzak WS80
17x7.5 Rial Kodiak



'15 Ram 1500 4WD Quad Cab
265/70R-17 Goodyear Ultra Grip Ice WRT SUV
17x8 Sport Edition TK5



WHAT ABOUT TPMS?

If your vehicle is equipped with a direct tire pressure monitoring system, we can recommend wheels that are compatible with its sensors. An extra set of sensors is also available for most systems, and can arrive pre-installed on your package!

*SPORT
Edition*



ST7
18 19 20



A11
17 18



P4
16 17 18

P3
16 17 18



A HUGE SELECTION OF OVER 1,100 DIFFERENT WHEELS



O.Z. Alleggerita HLT
16 17 18



O.Z. Leggera HLT
18 19 20



O.Z. Omnia
17 18



O.Z. Superturismo Dakar
20 21



O.Z. Ultraleggera HLT
19 20



Advanti HY Hybris
17 18



Avarus AV12
17 18 19 20



ANDROS N3
14 15 16 17



ANDROS R9
17 18



ANDROS Spec K
18 19



MSW Type 22
16 17



MSW Type 85
15 16 17

See Them on Your Vehicle!



Enter your vehicle at tirerack.com to experience one-click access to everything that fits it.



Enkei Tuning TX5
17 18



Enkei Perf. CUV
17 18 20



Enkei Perf. EKM3
17 18



Enkei Perf. RSF5
15 16 17 18



Axis Model Two
19 20 21

What About TPMS?



We can assist you in selecting wheels that are compatible with your vehicle's sensors. We also offer an extra set of sensors for all TPMS systems, so your tire and wheel package can arrive with sensors already installed.



Sparco Assetto Gara
14 15 16 17 18



Sparco Pro Corsa
17 18



Sparco Trofeo 5
17 18



Sparco Trofeo 5
17 18



Bremmer Kraft BR13
17 18



ALUTEC Monstr
17 18 19



ASA GT8
17 18 19

McLAREN 570S / MERCEDES-BENZ C450 AMG / LEXUS GS F / FERRARI 488 SPYDER



. SEDAN

CHEVROLET MALIBU PREMIER

TESTED + Spacious, capable, relatively light, and good-looking. □ Turbo 2.0 offers no advantage, busy cockpit, 19s wreck the ride. *by Aaron Robinson*

The three-box Chevy sedan arrived with the new-for-1949 Chevrolets, which grew proper trunks that were flattened and pulled out from the old bustle-back Fleetlines and Master Deluxes of the streamliner era. How many of us saw Dad off to work in a Biscayne or a Bel Air, or remember the mall lots clogged with Novas and Caprices? The Chevy sedan was everyman's car, the car you drove if you cared more about value than flash.

Malibus were once everywhere, even in Malibu, but the Japanese long ago moved the bull's-eye for high-value conformity, and Chevrolet has struggled to hit it. Too big, too small, too boring, too unreliable; the mid-size Chevy sedan devolved into a car you would rent but never buy. Well, here is GM's latest attempt to reverse the Malibu's typecasting.

As with the new Chrysler 200, the 2016 Malibu attempts to strum the heart-

strings with modern, swept styling. Look at its new shoulders and those tendon lines on the body sides. Muscle and sinew emerge as the light plays in interesting ways. The headlights squint menacingly, like a thug, or like a Camaro. Also like a Camaro (and all the new Cadillacs and Buicks), the Malibu's beltline is hiked way up to make the roof seem low, leaving narrow daggers for side glass. GM never tires of that bunker-top styling, no matter what it costs in visibility.

What it costs in dollars is \$22,500 for a base Malibu and \$34,285 for this absolutely loaded Premier. Those prices shadow mid-size majors such as the Honda Accord and Toyota Camry, though Chevy has followed the Hyundai Sonata's lead in making the Malibu four-cylinder only. This may save some weight and cost,

▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, front-wheel-drive, 5-passenger, 4-door sedan

PRICE AS TESTED \$34,285

BASE PRICE \$31,795

ENGINE TYPE: turbocharged and intercooled DOHC 16-valve inline-4, aluminum block and head, direct fuel injection

DISPLACEMENT 122 cu in, 1998 cc

POWER 250 hp @ 5300 rpm

TORQUE 258 lb-ft @ 1700 rpm

TRANSMISSION: 8-speed automatic with manual shifting mode

DIMENSIONS

WHEELBASE 111.4 in

LENGTH 193.8 in

WIDTH 73.0 in

HEIGHT 57.7 in

PASSENGER VOLUME 103 cu ft

CARGO VOLUME 16 cu ft

CURB WEIGHT 3307 lb

▼ C/D TEST RESULTS

ZERO TO 60 MPH 6.1 sec

ZERO TO 100 MPH 15.4 sec

ZERO TO 130 MPH 29.9 sec

ROLLING START, 5-60 MPH 6.7 sec

1/4-MILE 14.7 sec @ 97 mph

TOP SPEED (drag limited) 156 mph

BRAKING, 70-0 MPH 167 ft

ROADHOLDING, 300-FT-DIA SKIDPAD 0.87 g

FUEL ECONOMY

EPA CITY/HWY 22/32 mpg

C/D OBSERVED 20 mpg

TEST NOTES:

Despite moderate understeer at the limit, this Malibu has respectable grip for a family sedan. The brakes are fade-free with solid pedal feel.



↑ Above: The Malibu's interior styling isn't nearly as well resolved as its exterior. Left: Our driver being consumed by the Malibu.

but as with the turbo Mustang, we don't see any great benefit to owners. While the base 1.5-liter turbo four gives appropriate power and economy, at least on paper, the 250-hp 2.0-liter turbo in our test car delivered only V-6 fuel economy with not-quite-V-6 acceleration.

The Malibu 2.0T's 60-mph run is fleet enough at 6.1 seconds, but significantly slower than a comparable V-6 Camry or Accord. Meanwhile, the Malibu's mpg ratings, 22 city/32 highway, roughly match those of the Honda and Toyota V-6s. Our test average of 20 mpg proves the rule that a small turbo in a big car burns gas fast. Noted: A hybrid Malibu is coming with more Prius-like economy.

The mid-size segment is as much about dimensions as it is about price or power. Chevy used to bracket the Japanese leaders with two cars—one too small (Malibu) and one too big (Impala). Old Malibu was rightly savaged for its tight back seat as well as its dull styling, so New Malibu stretches its pizzazz over a 111.4-inch wheelbase, more than two inches longer than the Accord, the Camry, and the Nissan Altima, all of which have identical 109.3-inch wheelbases. The Malibu is a little longer overall than the rest, too, though our car's 3307-

pound test weight is a true triumph for the engineers, making the Malibu one of the lighter cars in its class.

The back-seat passengers benefit the most from the extra inches, with ample real estate to sit comfortably. Up front, the dash is a complicated sculpture built up from a multitude of pieces with different textures and colors, including a kind of futuristic faux wood with pinstriping. The cabin isn't ugly or cheap, but it is busy, with panel part-lines everywhere.

The optional eight-inch center touch screen—standard on the Premier (seven-inchers get fitted to lesser models)—looks like an iPad slid neatly into a docking port, and its large icons and many functions, including Apple CarPlay, will be familiar to anyone who has driven a late-model GM car. No, you still don't get a multifunction knob to work it with, as you do in a Mazda 6, so your fingers do the walking. Or you can bark commands at it.

In back, the tyranny of plain black plastic takes over, though the fancier versions give rear-seat riders their own USB ports and 12- and 120-volt outlets. Other practical conveniences

include trunk releases for the rear folding seats, but thanks to the sexy, hiked-up styling, the Malibu's bumper is a high hurdle to clear when loading the trunk itself.

The 19-inch rims and aluminum gas pedal of our Premier didn't fool anybody. Oh, the Malibu steers precisely and brakes earnestly, but it simply doesn't have the Accord's or Mazda 6's tactile feel or liveliness of spirit. The eight-speed automatic shifts without bump or bluster, and the engine makes particularly quiet power up to its 6500-rpm redline, adding to the Malibu's overall sense of solidity. The Premier model only comes on 19s, which make an otherwise disciplined suspension clomp over the rough stuff. A smoother ride is surely available on lesser models with their 16-, 17-, or 18-inch wheels.

If not an overtly sporty sedan, this spacious Malibu feels like a quality car, not at all like its many banged-together and shoved-out predecessors. That alone may propel a few through the barrier separating the rental lot from the private garage.



McLAREN 570S

Now you, too, can afford a supercar! *by Eric Tingwall*

■ Cut the kids' allowances and halt the 401(k) contributions. Meat and alcohol are out; your new diet consists of rice, beans, and ketchup packets from the office cafeteria. Who needs cable or an iPhone when you're living in the moment? You're going to own a supercar!

Don't get caught up on the baby McLaren's \$187,400 base price. Like most 570S customers, you only need concern yourself with 36 monthly lease payments of roughly \$2200 each. That's not exactly Accord money, but it makes us wonder: Wouldn't we be happier if all of life's little luxuries were traded for one big and fast luxury?

McLaren says that the 570S will primarily be sold or leased to folks who own two or three cars, rather than to 650S and P1 owners who have 20 to 30 vehicles. This is a car intended more for the street than the track, so it includes such niceties as door pockets and vanity mirrors. An optional front-end lifter helps clear speed bumps while the electric steering-column adjuster flies in the face of McLaren's fastidious weight-saving obsession.

The carbon-fiber tub upholds the brand's construction traditions; it gets propelled by a twin-turbo 3.8-liter V-8 and a seven-speed dual-clutch transmission held in common with the 650S. To drive a distinction between that pricier offering, McLaren emphasizes that the 570S is a

▼ SPECIFICATIONS

VEHICLE TYPE: mid-engine, rear-wheel-drive, 2-passenger, 2-door coupe	
BASE PRICE	\$187,400
ENGINE TYPE: twin-turbocharged and intercooled DOHC 32-valve V-8, aluminum block and heads, port fuel injection	
DISPLACEMENT	232 cu in, 3799 cc
POWER	562 hp @ 7400 rpm
TORQUE	443 lb-ft @ 5000 rpm
TRANSMISSION: 7-speed dual-clutch automatic with manual shifting mode	
DIMENSIONS	
WHEELBASE	105.1 in
LENGTH	178.3 in
WIDTH	75.4 in
HEIGHT	47.3 in
PASSENGER VOLUME	49 cu ft
CARGO VOLUME	4 cu ft
CURB WEIGHT	3200 lb
PERFORMANCE (C/D EST)	
ZERO TO 60 MPH	3.1 sec
ZERO TO 100 MPH	6.3 sec
1/4-MILE	10.9 sec
TOP SPEED	204 mph
FUEL ECONOMY	
EPA CITY/HWY	16/23 mpg





mere sports car, but those dihedral doors don't lie. This is a starter supercar.

Of course, sacrifices must be made to price a McLaren like a modest Midwestern home. There are no active aerodynamic tricks, and the 570S uses aluminum rather than carbon fiber for most of its body panels, although McLaren says it should weigh about the same as a 650S, at 3200 pounds. These are reasonable concessions, but it's too bad that the budget didn't allow for McLaren's Proactive Chassis Control, which replaces conventional dampers and anti-roll bars with a network of high-pressure hydraulic components. In the 650S, that system delivers an almost baffling magic-carpet ride quality with remarkable handling.

The 570S employs less-exotic adaptive dampers and conventional anti-roll bars. It still stakes out a nice middle ground between soft and brutal, but does so with less bandwidth than its big brother. The cornering isn't quite as flat, the ride isn't nearly as supple, and the differences between settings aren't as palpable.

Around the Algarve International Circuit in southern Portugal, the 570S floats over blind crests and tucks into hairpins with a preternatural calm. It brakes

downhill with its tail faithfully following its nose and tackles triple-digit speeds with all the drama of a highway cruise. Yet at corner exit, we were repeatedly antagonized by a 562-hp car that is too docile. With the steering wheel pointed straight and our foot flat to the floor, the 570S puttered away from corners at a minivan's pace until—one . . . two . . . three seconds later—our aggravation was answered by an explosion of power and speed.

This is not turbo lag. McLaren's small-displacement V-8 hides its turbochargers in a smooth, linear surge to 8500 rpm. With its abundant horsepower and 443 pound-feet of torque, calling the 570S the least powerful McLaren is akin to calling a rattlesnake the least deadly viper.

Nor is it the fault of McLaren's seven-speed dual-clutch gearbox, which swaps cogs fast enough to make Porsche's seemingly perfect PDK appear flawed. When we get our test gear on the McLaren 570S, we're expecting a 3.1-second

shot to 60 mph and a sub-11-second quarter-mile.

The problem is a traction-control system that rules with the tyranny of Stalin. Where track mode deactivates the nannies in the 650S, the 570S isn't set free until you thumb the new stability-control button. In dynamic mode or with the ESC fully defeated, the intensity of both the powertrain and the chassis rose to our expectations. Looser and more rambunctious, the 570S masked its penchant for understeer with easy, graceful power oversteer on corner exit and full thrust on the straights.

Even wearing Pirelli P Zero Corsas, grip isn't overwhelming. This is the one area where the suggested distinction between the 570S and a bona fide supercar holds water. A bit of slip makes the car accessible and enjoyable without tripling the speed limit, and besides, track-oriented variants are inevitable.

It's not surprising, then, that the McLaren 570S is best relished on winding roads. Within the confines of its limits, the 570S perfectly traces the driver's intentions. It chains together corners and bounds over busted roads with refrigerated poise and seamless fluidity. However, if the presiding criticism of the \$267,900 650S is that it's a bit remote and unfeeling, the 570S won't rewrite the brand's reputation. The steering is alert and turn-in is instantaneous, but the assist is flat, never really building with cornering load, and feedback is minimal.

But beggars can't be choosers. McLaren's 570S offers incredible performance, a carbon-fiber structure, the mid-mounted engine, and doors that announce your arrival. For \$80,000 less than the 650S, the 570S accelerates just a couple of tenths off that car's pace and corners with the same attitude. It has far more in common with the supercar that spawned it than any sports car we know. Now, where can we find \$25,000 for the down payment?

→ The 570S: A dose of McLaren that even the merely wealthy can afford. Yes, Silicon Valley fans, it has doors that open like this.





MERCEDES-BENZ C450 AMG

TESTED The middle child with no hint of behavioral issues. Options are frightfully expensive.
by Don Sherman

When Mercedes married AMG in 2005 following a lengthy courtship, who would have expected that union to spawn 38 children? Not all those babies come to the U.S., but we do receive our share and more are on their way. The car on this page is the first middle child, a sports sedan badged Mercedes-Benz C450 AMG. It's been reared to fill the void between regular Mercedes-Benz C-class models aimed at law-abiding citizens and the rowdy Mercedes-AMG C63.

Fret not over this C's lack of a V-8. A new twin-turbo direct-injected 3.0-liter V-6 cranks out enough energy—362 horse-

power, 384 pound-feet of torque—for the C450 to run with or past competitors such as the Audi S4, BMW 340i, Cadillac ATS, and Jaguar XE S. Aided by standard four-wheel drive, it bolts to 60 mph in 4.5 seconds and through the quarter in 13.1, just a few tenths of a second behind the 503-hp C63 S. Living with only a six-pack under the hood benefits mileage and chassis balance and drops the base price to \$51,725—within reach of middle management.

The C450 has a nicely balanced performance portfolio. Panic stops from 70 mph in 160 feet rival the best competitors. The 0.93-g cornering grip is also exemplary, topping all BMWs lacking full M specifications. Thanks to a fixed 33/67-percent front/rear torque split, you can power out of bends in the wet without fear that the tail will slip first. Three-stage dampers handed down from the C63 provide body-motion control ranging from firm to extra firm, accessible via a console toggle.

“Discreet” best describes the C450's exterior. There's minimal AMG identification. But a megasized three-pointed star in the grille assures that no one will mistake this for a Suzuki.

← Unlike the stereotypical middle child, the C450 AMG is confident, comfortable, and rarely chooses a career in petty crime.



▼ SPECIFICATIONS

VEHICLE TYPE: front-engine, 4-wheel-drive, 5-passenger, 4-door sedan
PRICE AS TESTED \$65,555
BASE PRICE \$51,725
ENGINE TYPE: twin-turbocharged and intercooled DOHC 24-valve V-6, aluminum block and heads, direct fuel injection
DISPLACEMENT 183 cu in, 2996 cc
POWER 362 hp @ 6000 rpm
TORQUE 384 lb-ft @ 2000 rpm
TRANSMISSION: 7-speed automatic with manual shifting mode
DIMENSIONS
WHEELBASE 111.8 in
LENGTH 184.5 in
WIDTH 71.3 in
HEIGHT 56.8 in
PASSENGER VOLUME 95 cu ft
CARGO VOLUME 13 cu ft
CURB WEIGHT 3834 lb

▼ C/D TEST RESULTS

ZERO TO 60 MPH 4.5 sec
ZERO TO 100 MPH 11.2 sec
ZERO TO 130 MPH 20.2 sec
ROLLING START, 5-60 MPH 5.4 sec
1/4-MILE 13.1 sec @ 108 mph
TOP SPEED (governor limited) 131 mph
BRAKING, 70-0 MPH 160 ft
ROADHOLDING, 300-FT-DIA SKIDPAD 0.93 g
FUEL ECONOMY
EPA CITY/HWY 21/29 mpg
C/D OBSERVED 18 mpg

■ TEST NOTES:

Steering feedback at the limit is vague, making the max-g sweet spot hard to find. Launch technique plays little in acceleration results.



Interior designers earned their keep by crafting one of the most nicely outfitted cabins on the market. The front buckets provide perfect restraint and long-lasting comfort without impeding ingress or egress. The rear bench seat coddles two and accommodates a third in a pinch.

Nice-to-touch steering-wheel paddles command the seven-speed transmission. While aggressive driving in automatic mode can elicit jerky downshifts, manual gearchanges are swift and smooth.

A fixed, non-touch center screen is your window to the C450's nervous system. Key in the appropriate commands and you can fine-tune chassis and power-train operations or display an entertaining power-and-torque gauge.

While leather is available at no extra charge, the MB-Tex vinyl upholstery is attractive and satisfying to touch. If you can live without the tanned-hide aroma, it's worth a try. The only ergonomic flaw is a cruise-control stalk hidden behind a steering-wheel spoke.

The C450 AMG's blend of performance, congeniality, and relative affordability suggests that Mercedes is on to something here. We say bring us more middle children.

AutoAnything®

THE LAST AIR FILTER YOU'LL EVER BUY!

K&N AIR FILTERS

The washable and reusable pleated and oiled cotton gauze filtration medium runs up to 50,000 miles between cleanings, depending on highway conditions. Backed by a 10-year / 1,000,000 Mile Warranty. Installs in minutes.

"Amazing Filters!"

"K&N are the best filters on the market. I wouldn't use anything else. The first thing I do when I buy a new truck is order a K&N Filter for it. Thanks K&N!!!"
- Lewis W. (West Haven, UT)



\$33.99
FROM

MORE POWER & TORQUE!

K&N COLD AIR INTAKES*

Boost power and torque with a K&N Cold Air Intake. Custom-engineered with the famous K&N Filtercharger cone filter and power-tuned intake tract. Backed by a 10-year / 1,000,000 Mile Warranty. Easy installation.

\$163.99
FROM

*Street legal in most states. Some intake systems are not legal for use on certain vehicles in California or other states adopting CA emission standards. See online for CARB status on each part for a specific vehicle.



EXPERIENCE MONSTROUS POWER & SOUND!

\$216.95
FROM



CUSTOM EXHAUST SYSTEMS

Ditch your restrictive stock pipes and move up to a powerful performance exhaust system. Big power gains, a throaty growl and improved fuel economy—that's what a performance exhaust system delivers. And, each system is custom-bent for your exact year, make and model.

MUFFLERS From **\$33.95**
CATALYTIC CONVERTERS From **\$62.95**
HEADERS From **\$131.95**
EXHAUST SYSTEMS From **\$216.95**



UPGRADE YOUR BRAKES FOR LESS!

PERFORMANCE BRAKE PADS & ROTORS

Looking for brakes, rotors or pads? AutoAnything is your stop for brakes and brake kits. Whether you're going for high performance or you're simply doing general maintenance, we've got the brake pads, rotors and kits for you.

BRAKE PADS From **\$27.95/PR.**
BRAKE ROTORS From **\$43.90 EA.**
BRAKE KITS From **\$122.99/KIT**



PROTECT YOUR INTERIOR WITH CUSTOM FLOOR MATS & LINERS! See our huge selection online.



\$94.99
FROM

MAXLINER MAXFLOORMATS



\$49.99
FROM

PROZ FLEXOMATS FLOOR MATS



\$54.90
FROM

LYLOYD MATS RUBBERTITE FLOOR MATS



\$85.95
FROM

HUSKY LINERS FLOOR LINERS

GEAR UP FOR WINTER TRAVEL! Visit us online for our complete selection of winter driving accessories.



\$19.95
FROM

PET TRAVEL

Invite your four legged friend to travel in style with our huge selection of pet travel accessories.



\$116.10
FROM

SKI/BOARD RACKS

Deck out your auto with quality ski racks for less from AutoAnything. See our huge selection from the top brands.



\$169.77
FROM

CUSTOM SEAT COVERS

Protect your interior from the rigors of winter and keep your factory seats looking new. 100's of styles and colors available.



\$99.99
FROM

CUSTOM CAR COVERS

A custom car cover protects your paint from the elements and preserve your resale value.

AutoAnything.com | 888.686.5870



FREE SHIPPING¹
No Hidden Fees



1-YEAR PRICE GUARANTEE²
All Prices Backed for a Full Year from Purchase

© 2013 AutoAnything, Inc. All Rights Reserved. AutoAnything is a registered mark of AutoAnything, Inc. All other marks are the property of their respective owners. Prices subject to change. Not responsible for typographical errors. 1. Free Shipping to Continental US only. No APO/POs. Truck, oversized & select shipments excluded. 2. Find it for less and we'll refund the difference up to 1 year from purchase. Some restrictions apply. See website for complete details and restrictions.



▼ SPECIFICATIONS

VEHICLE TYPE:	front-engine, rear-wheel-drive, 5-passenger, 4-door sedan
BASE PRICE	\$85,380
ENGINE TYPE:	DOHC 32-valve Atkinson-capable V-8, aluminum block and heads, port and direct fuel injection
DISPLACEMENT	303 cu in, 4969 cc
POWER	467 hp @ 7100 rpm
TORQUE	389 lb-ft @ 4800 rpm
TRANSMISSION:	8-speed automatic with manual shifting mode
DIMENSIONS	
WHEELBASE	112.2 in
LENGTH	193.5 in
WIDTH	72.6 in
HEIGHT	56.7 in
PASSENGER VOLUME	91-92 cu ft
CARGO VOLUME	14 cu ft
CURB WEIGHT	4150 lb
PERFORMANCE (C/D EST)	
ZERO TO 60 MPH	4.4 sec
ZERO TO 100 MPH	10.0 sec
1/4-MILE	12.9 sec
TOP SPEED	168 mph
FUEL ECONOMY	
EPA CITY/HWY	16/24 mpg

LEXUS GS F

Attention sports-sedan shoppers: Don't miss the fresh meat in aisle three. *by Don Sherman*

F words may be our favorite means of spewing contempt, but across the cultural divide, the letter F commands respect. In Japan, Mount Fuji is worshipped as a natural shrine, and car enthusiasts scratch their performance itches at Fuji International Speedway. In the 1980s, when Toyota mounted its assault on German luxury sedans, Circle F was the code name for the Lexus LS400.

Now F signifies the fastest and finest Lexus has to offer. While 15 models have enjoyed F Sport performance and cosmetic upgrades, the brand's hallowed stand-alone F badge has thus far appeared on but three cars: the IS F, the LFA, and the RC F coupe. The mid-size GS F sedan is the fourth, and it arrives as a 2016 model.

Think of the GS F as an RC F with two more doors and a real back seat. A nose job distinguishes it from lesser GS editions. This is the spindle-grilled special for families with \$85,380 to spend on an alternative to the Audi S6, BMW M5, Cadillac CTS-V, and Mercedes-AMG E63. While competitors use boost to fortify performance, Lexus is sticking by what it knows best: a 467-hp 5.0-liter naturally aspirated V-8 tormenting pavement through an eight-speed paddle-shifted automatic and a torque-vectoring differential—essentially the RC F's powertrain. That puts it nearly 200 horses down on the CTS-V. Special features include the use of both port and direct fuel injection for optimum combus-

tion all the way from idle to the 7300-rpm redline, and the ability to switch between Atkinson-cycle running for efficient cruising and Otto-cycle operation for when you want to uncage all the elephants. What you notice from the driver's seat is hearty throttle response and enough speed to justify the premium price. Hustling this large, heavy, gentle-riding sedan on mountain roads north of Madrid and during hot laps of the Jarama race circuit, we were impressed by chief engineer emeritus Yukihiko Yaguchi's ability to instill highway poise and track skills into one car that betrays no hint of multiple-personality disorder.

This was achieved by attending to the fundamentals, such as reinforcing the unibody with six crossmembers and extra laser welds. There are also non-variable ZF Sachs dampers, massive Brembo brakes, and Michelin Pilot Super Sport tires mounted on forged BBS wheels. The secret weapon is the cagey torque-vectoring differential that kicks the tail of the car around a bend after you think you've exploited every last shred of traction.

Spindle grilles may be an acquired taste, but the F's cabin is nicely trimmed with contrast-stitched leather and a choice of

Alcantara or carbon-fiber accents. Supplementing the console mouse commanding the 12.3-inch center screen, there are his and her buttons (one per front occupant to avoid spats) and a four-position mode selector. Two gripes: The steering-wheel rim is too thick and slippery for good grip, and the bulky differential demotes the rear-center seating position to kid-only space. Bring treats.

This Lexus may not have the incumbents sulking toward the locker room in anticipation of defeat, but it will certainly liven up our next supersedan face-off.

▼ Who really needs more than 467 horsepower in a luxury sports sedan? Oh right, Cadillac CTS-V buyers.



HARBOR FREIGHT

QUALITY TOOLS AT RIDICULOUSLY LOW PRICES

How Does Harbor Freight Sell GREAT QUALITY Tools at the LOWEST Prices?

We have invested millions of dollars in our own state-of-the-art quality test labs and millions more in our factories, so our tools will go toe-to-toe with the top professional brands. And we can sell them for a fraction of the price because we cut out the middle man and pass the savings on to you. It's just that simple! Come visit one of our 600 Stores Nationwide.

SCISSOR SUPER COUPON

20% OFF

ANY SINGLE ITEM

Limit 1 coupon per customer per day. Save 20% on any 1 item purchased. *Cannot be used with other discount, coupon or any of the following items or brands: Inside Track Club membership, extended service plan, gift card, open box item, 3 day parking lot sale item, compressors, floor jacks, saw mills, storage cabinets, chests or carts, trenchers, welders, Admiral, CoverPro, Daytona, Diablo, Franklin, Hercules, Holt, Jupiter, Predator, Silk-Tek, StormCat, Union, Vanguard, Viking. Not valid on prior purchases. Non-transferable. Original coupon must be presented. Valid through 4/1/16.



SCISSOR SUPER COUPON

FREE

WITH ANY PURCHASE

PITTSBURGH 6 PIECE SCREWDRIVER SET

LOT 47770
61313/62583/62728
62570 shown

\$6.99
VALUE

Limit 1 - Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores. HarborFreight.com or by calling 800-423-2567. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 4/1/16. Limit one FREE GIFT coupon per customer per day.



SCISSOR SUPER COUPON

RAPID PUMP® 3 TON LOW PROFILE HEAVY DUTY STEEL FLOOR JACK

• Weighs 73 lbs.

LOT 61282 shown
68049/61253
62326/62670

\$84.99 comp at \$169.99

SAVE \$85

Customer Rating ★★★★★



SCISSOR SUPER COUPON

4" MAGNETIC PARTS HOLDER

PITTSBURGH ALUMINUM

LOT 62535
90566 shown

\$1.99 comp at \$5.99

SAVE 66%

Customer Rating ★★★★★



SCISSOR SUPER COUPON

3 GALLON 100 PSI OILLESS HOT DOG STYLE AIR COMPRESSOR

Customer Rating ★★★★★

LOT 69269
97080 shown

\$39.99 comp at \$99.88

SAVE \$59

Customer Rating ★★★★★



WOW SUPER COUPON

4000 PEAK/3200 RUNNING WATTS 6.5 HP (212 CC) GAS GENERATORS

Customer Rating ★★★★★

LOT 69729/69676 shown
LOT 69675/69728 CALIFORNIA ONLY

\$288.88 ~~\$359.99~~ comp at \$529.99

SAVE \$241

70 dB noise level

Customer Rating ★★★★★



WOW SUPER COUPON

29 PIECE TITANIUM NITRIDE COATED HIGH SPEED STEEL DRILL BIT SET

Customer Rating ★★★★★

LOT 5889/62281/61637 shown

\$13.99 ~~\$19.99~~ comp at \$59.97

SAVE 76%

Customer Rating ★★★★★



SCISSOR SUPER COUPON

2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL

Customer Rating ★★★★★

LOT 61840/68146
61297/61258 shown

\$59.99 comp at \$259.99

SAVE \$200

Customer Rating ★★★★★



WOW SUPER COUPON

1/2" INDUSTRIAL QUALITY SUPER HIGH TORQUE IMPACT WRENCH

Customer Rating ★★★★★

LOT 62627/68424 shown

\$77.18 ~~\$99.99~~ comp at \$249.99

SAVE \$172

700 ft. lbs. max. torque

Customer Rating ★★★★★



SCISSOR SUPER COUPON

26", 4 DRAWER TOOL CART

Customer Rating ★★★★★

LOT 95659 shown
61634/61952

\$99.99 comp at \$349.99

SAVE \$250

Customer Rating ★★★★★



SCISSOR SUPER COUPON

TORQUE WRENCHES

Customer Rating ★★★★★

Item 239 shown

\$11.99

SAVE UP TO 83%

• Accuracy within ±4%

DRIVE	LOT	COMP AT
1/4	2696/61277	\$29.99
3/8	807/61276	\$54.91
1/2	62431/239	\$73.22

Customer Rating ★★★★★



SCISSOR SUPER COUPON

2 PIECE VEHICLE WHEEL DOLLIES

Customer Rating ★★★★★

LOT 60343
67338 shown

\$49.99 ~~\$50~~ comp at \$99.99

SAVE \$50

Customer Rating ★★★★★



SCISSOR SUPER COUPON

POWDER-FREE NITRILE GLOVES

Customer Rating ★★★★★

LOT 68498 shown

\$6.49 comp at \$14.97

SAVE 56%

• 5 mil thickness

Customer Rating ★★★★★



WOW SUPER COUPON

12" SLIDING COMPOUND DOUBLE-BEVEL MITER SAW WITH LASER GUIDE

Customer Rating ★★★★★

LOT 61969
61776/61970
69684 shown

\$134.99 ~~\$194.99~~ comp at \$399

SAVE \$264

Customer Rating ★★★★★



• 100% Satisfaction Guaranteed
• Over 25 Million Satisfied Customers

• No Hassle Return Policy
• Lifetime Warranty On All Hand Tools

• 600 Stores Nationwide
• HarborFreight.com 800-423-2567

FERRARI 488 SPIDER

Where there was a wail, now a woof. Where there was a gale, now a roof. *by Mike Duff*

Ferrari's open-top cars have always attracted a different clientele than its coupes. While the company admits that the 488GTB appeals primarily to alpha males who like to drive solo and routinely take their cars to the track, Spiders attract those who want to pilot them roof-down with a passenger. They are, the company says, "open-car hedonists looking for driving emotions." Which presents a paradox: Because although 90 percent of these leathery debauchees would apparently not even consider a hardtop Ferrari, they are effectively buying just that with the 488 Spider, which is a hardtop right up until it isn't.

It's not been long since buying an open-

top Ferrari meant making significant sacrifices beyond merely the increased risks of acquiring skin cancer and a much younger wife. Convertibles were fatter, less rigid, and slower. No longer. The 488 Spider is 110 pounds heavier than the GTB, the mass added by the roof and some underbody reinforcement, but Ferrari claims identical 3.0-second zero-to-60-mph times for each car. The Spider is also said to be within a second of the coupe's lap time around the Fiorano test circuit and has, with its roof raised, 95 percent of the torsional rigidity of the GTB. All suspension settings are identical in both cars.

The two-part folding top is made from aluminum, not carbon, and motors its way

↓ With minimal weight gain and no real loss in performance, the 488 Spider asks, "Why not get your Ferrari with a convertible top?"



▼ SPECIFICATIONS

VEHICLE TYPE:	mid-engine, rear-wheel-drive, 2-passenger, 2-door convertible
BASE PRICE (est)	\$270,000
ENGINE TYPE:	twin-turbocharged and intercooled DOHC 32-valve V-8, aluminum block and heads, direct fuel injection
DISPLACEMENT	238 cu in, 3902 cc
POWER	661 hp @ 8000 rpm
TORQUE	561 lb-ft @ 3000 rpm
TRANSMISSION:	7-speed dual-clutch automatic with manual shifting mode
DIMENSIONS	
WHEELBASE	104.3 in
LENGTH	179.8 in
WIDTH	76.9 in
HEIGHT	47.7 in
CARGO VOLUME	8 cu ft
CURB WEIGHT	3500 lb
PERFORMANCE (C/D EST)	
ZERO TO 60 MPH	3.0 sec
ZERO TO 100 MPH	6.4 sec
1/4-MILE	10.6 sec
TOP SPEED	205 mph
FUEL ECONOMY (C/D EST)	
EPA CITY/HWY	15-16/22 mpg

under the rear clamshell in just 14 seconds. That does mean the loss of the GTB's see-through engine cover, and there's also a noticeable line where the two roof panels join. Yet that's about all the compromise you have to make; with the roof in place, the Spider's cabin feels every bit as well insulated as the coupe's.

Ferrari laid on a drive through the hills around San Marino that included several roads seemingly surfaced by Italy's most corrupt contractors. From gentle progress to the sort of cross-country pace the Italian air force would regard as reckless, there was no hint of structural shake or unwanted vibration, roof up or down.

The new turbocharged V-8 sounds great when sampled unfiltered, too, though it's not quite as good as its predecessor. It's bassier, but it can't match the animalistic wail the 458 Spider reserved for the very top of its 1000-rpm-higher power band. But apart from the faint flutter of the waste gates—only audible with the roof raised, strangely—there's little aural evidence of forced induction.

There's plenty of evidence everywhere else, with the blown V-8's torque ideally suited to the way most Spider owners will probably drive their cars. With 661 rampant horses available all the way from 6000 rpm to the 8000-rpm cutoff, there's no use in bouncing it off the rev limiter.

The 488 Spider disproves the charges of arrogance often leveled at Maranello. Ferrari could have made this car softer, flabbier, and less focused than the coupe, and its core clientele would likely not have noticed or cared. The 488GTB is a remarkable piece of engineering, but the Spider is indeed a greater one. ■

WeatherTech®

Automotive Accessories



FloorLiner™

Provides "absolute interior protection"™

Laser measured to perfectly fit your vehicle

Has channels to carry fluids and debris to a lower reservoir

Material provides soft touch top, rigid core strength and bottom surface friction

See our full line of Automotive Accessories at WeatherTech.com



No-Drill MudFlaps

Protect your vehicle's most vulnerable rust area

No drilling into vehicle's fragile metal surface



BumpStep®

Hitch Mounted Bumper Protection



License Plate Frames

Many styles and colors available
Visit WeatherTech.com to view the full selection

Accessories Available for

Acura · Audi · BMW · Buick · Cadillac · Chevrolet · Chrysler · Dodge · Ferrari · Ford · GMC · Honda · Hummer · Hyundai · Infiniti · Isuzu · Jeep · Kia · Land Rover · Lexus · Lincoln · Maserati · Mazda · Mercedes-Benz · Mercury · Mini · Mitsubishi · Nissan · Oldsmobile · Plymouth · Pontiac · Porsche · Saab · Saturn · Scion · Subaru · Suzuki · Toyota · Volkswagen · Volvo · and more!

Order Now: **800-441-6287**



American Customers
WeatherTech.com



Canadian Customers
WeatherTech.ca



European Customers
WeatherTechEurope.com

SPOIL HER

this Christmas!

It's a gift you'll BOTH love!

Over 200 premium PJs, each with:

- FREE Keepsake gift packaging
- FREE Personalized card

1.800.GIVE.PJS
PajamaGram.com

Pajamagram



Shown: Ruby Velour Lounge Set

CALLING ALL CARS



Luxury, Sport, Classic Autos & High-End RV's for-sale-by-owner.

Buyers/Sellers
1-800-546-8457
www.cacars.com

RAGGTOPP

Manufacturer Approved

CONVERTIBLE TOP CARE PRODUCTS

Exterior and Interior Protection for Fabric, Vinyl and Leather

\$5 Off Your Next Order of \$50 or more
Use Coupon Code: CandD



Tested and Endorsed by

HAARTZ

Original Equipment Manufacturer of Fabric and Vinyl Convertible Topping

(800) 377-4700
www.Wolfsteins.com

Oil Vanish[™]

Oil Stain Remover

NEW!



Available at these fine retailers

AutoZone
amazon.com

Do it Best

BOND[™]

THE HOME DEPOT



Quickly dissolves oil stains from driveways, garages and parking areas. Penetrates deep to lift the toughest stains - new or old.

Easy-to-Use: Apply, Scrub and Rinse.

Visit OilVanish.com

BRAKEWORLD

GUARANTEED BEST PRICE • LARGEST SELECTION
GUARANTEED FITMENT • ADVICE YOU CAN TRUST

ULTRA HIGH QUALITY ROTORS



- Massive Stopping Power
- Cooler Brakes
- Longer Rotor Life



PERFORMANCE BRAKE PADS

- NO BLACK DUST
- Super Quiet & Clean
- Shorter Stopping Distance
- Longer Pad Life
- Advanced Ceramic & Kevlar Pads



STAINLESS STEEL BRAKE LINES



PROTECTED NANO COATED ROTORS

- AVAILABLE IN:
- Chrome
 - Black
 - Red
 - Gold
 - Blue



SHOP ONLINE 24/7 WWW.BRAKEWORLD.COM
TOLLFREE: 866.272.5396

WHOLESALE PRICES!!

ADVENTURE TO GO!

Now Just \$349

America's Most Popular Inflatable Kayak!



GO Anywhere, Anytime!
Easy Carry, Easy Paddle!

FREE GROUND SHIPPING to 48 Contiguous US



Paddle wild rivers, remote ponds, secluded bays, scenic lakes...even ocean surf! Sea Eagle 370 Pro Inflatable Kayak Package includes 2 8' paddles, 2 deluxe kayak seats, foot pump & nylon carry bag.

Special Sale - NOW \$349 COMPLETE

WITH FREE GROUND SHIPPING To 48 Contiguous United States

Visit SeaEagle.com to order & for more info or Call for Catalog 1-800-748-8066

SEA EAGLE.com

Join us on Facebook /SeaEagleBoats

19 N. Columbia St., Dept CA016B Port Jefferson, NY 11777

YOUR PAINT'S WORST ENEMY HAS MET ITS MATCH...

SQUIRT
SQUIRT OUT A FEW DROPS OF THE OEM-MATCHED PAINT

SQUEEGEE
USING THE SPECIAL SQUEEGEE, SMEAR THE PAINT INTO THE CHIPS

BLEND
SEALACT BLENDS THE EXCESS PAINT

PERMANENT REPAIRS IN JUST MINUTES, **NOT HOURS!**

SQUIRT N SQUEEGEE KIT IS THE FAST, SIMPLE, DRAMATIC WAY TO REPAIR PAINT CHIPS - **WITH NO PAINT BLOBS!**

ORDER YOUR KIT TODAY -
REPAIR KITS AVAILABLE IN 4 SIZES FROM \$39.95

RATED #1 BY THE WALL STREET JOURNAL

DR. COLORCHIP
AUTOMOTIVE PAINT CHIP REPAIR SYSTEMS
DRCOLORCHIP.COM • 866.372.2548

PRICE • CAR COVER KIT INCLUDES LOCK, CABLES AND FREE STORAGE BAG • MIRROR POCKETS • FRONT & REAR REFLECTOR STRIPS • PATENT PENDING DESIGN • FREE FABRIC SAMPLE

HOLIDAYS COVERED?

Order a **SELECT-FIT** outdoor/indoor silver car cover or a **NEW! SELECT-FLEECE** indoor/show black car cover by Dec. 21 to arrive by Christmas Eve.

★★★★★
—Tesla Model S owner

Free 2-Day Shipping
(CONTINENTAL USA)
Code: **DEC24CD**

Fits perfectly...very well made!
—Dodge Challenger owner

Outdoor/Indoor **SELECT-FIT** from \$99.95
Indoor/Show **SELECT-FLEECE** from \$179.95

MICROBEAD
MicrobeadCarCovers.com
888-627-1129
TEXT YOUR YEAR, MAKE AND MODEL TO 617-657-4212 FOR MORE INFO

• LIFETIME REPLACEMENT WARRANTY •

Is there a proposal in your future?

Your bride will always remember your special day.

1. John Smith
Propose Marriage to
Jane Doe
on June 15th 2015
at Bridal
Veil Falls

▲ Choose from a selection of rings created by top California jewelry designers

▲ Your personal message engraved on a plaque

▲ Includes a U.S. minted gold coin

▲ Or we provide a quality gem-grade diamond attached to a gold coin to be set in a ring of your choice

Toll Free 1.844.722.2787
Visit our website for pricing and details:
californiacollectors.net
bob@californiacollectors.net

CALIFORNIA COLLECTORS

1915 2015
THOMPSON & CO.
FINE CIGARS FOR 100 YEARS

POWER HOUSE 16 CIGAR COMBO

- 16 Premium Hand-Rolled Cigars
- Bonus Cherrywood-finish Humidor (Holds 20 Cigars)
- Ultra Reliable Butane Lighter
- A Guillotine Cigar Cutter

Call 1-800-437-8424 or visit thompsons specials.com

Promo Code **TA362**
Add \$4.95 for Shipping – #887870.

OFFER GOOD FOR 30 DAYS One per customer, Florida residents ADD 7% sales tax, not available to minors and good only in the USA
All Written orders must include your date of birth and signature.
In the event of high demand, substitutions of equal or greater value may occur.

SAVE 83%

Compare similar at ~~\$178.65~~
\$29⁹⁵

Order Now Limited Supply

©2016 Thompson Cigar Co.

what i'd do differently ...

116

01.2016

JUDY STROPUS

Since the '60s, Judy Stropus, 72, had been the nonpareil timer/scorer in American racing. She was a no-bull observer of racing's most glorious era, as she demonstrates here.

C/D: How did you discover your talent as a timer/scorer?

JS: I was 18, living in Queens, New York, working as a legal secretary, and my boyfriend at the time was racing his Jaguar XK120. The two of us had joined the Queens Sports Car Club, and one weekend I was asked to help with lap charts at Bridgehampton, where the SCCA people were amazed at how easy it was for me. But I'd won prizes for my Pitman shorthand in secretarial school, and it turned out there was a real connection—I have this ability to move my eyes very quickly, to vibrate my eyes back and forth. I'm also able to do figures inside my head quickly. I'm told it's almost a savantlike ability, to do this hour after hour without making mistakes.

C/D: How did you chart a 50-car field with a single stopwatch?

JS: Anyone can time several cars with a stopwatch, but I could time dozens during practice and qualifying and provide instant, accurate information as to where each car stood. Where it gets really complicated is scoring long-distance races with pit stops that scramble the order of the cars. At Indy, it's particularly difficult because the cars go by so fast on the ovals. But I almost never made mistakes, which is what got peoples' attention.

C/D: How awkward was it for you as a woman in the late '60s?

JS: There was this great respect, fear almost. There weren't too many women around, or at least women with positions of responsibility. Previously, somebody's wife would time them.

C/D: Was sex ever an issue?

JS: No, sex was never an issue, and I never made it an issue. The only women most of the guys were accustomed to seeing in the pits in those days were the race queens, such as a favorite friend of mine, Linda Vaughn. She interacted beautifully with them in her carefree way. I, however, scared the shit out of them. The only time in my professional life when I didn't get respect was when I started to race cars myself. Eventually I got good enough to reach the SCCA Runoffs, but right from the start some of my competitors were so pissed off that they had to race against a woman that they protested me, the car, our setup, whatever they thought they could take to the officials.

C/D: When did Roger Penske come in?

JS: After working for Bud Moore, I timed for the Javelin factory team, and then at Laguna Seca, I think, Roger came up and said, "Why aren't you working for me?" He wanted me for Can-Am. Mark Donohue was running the Porsche 917.

C/D: This was your introduction to Donohue?

JS: Yes, and I just loved it. I used to say that if I ever committed suicide it'd be on a Monday because I hated going back to work in the law office after the weekends. At just about every race we were such a little core of a team. Hanging out, going to dinner, drinking, talking, and the work was completely involving.

C/D: And you became the sounding board?



JS: Yes, people trusted me because I didn't share information.

In a race car these guys were focused 100 percent, as they had to be, but otherwise they were pretty sensitive, thoughtful human beings. Mark was the same way. Although he was unique in that he was an engineer, he was also one of those insecure people who was afraid of losing his job.

C/D: Donohue retired, then came back in 1974?

JS: Well, he missed being in a race car. I knew that, just as I knew he realized he wasn't a businessman or even a good team manager. He called me asking, "So what do you think?" I said: "I don't think you should do it. Stay retired." Then he died, and his death devastated me.

C/D: You timed Le Mans multiple times. How did you go the full 24 hours without leaving your timing stand?

JS: Of course that was my claim to fame. I probably wouldn't have the stamina to do it now, but back then, instead of taking liquids, I'd suck on a piece of ice or eat fruit.

C/D: How was it to work for Penske?

JS: In the beginning, I suspect, he had a problem delegating authority. At Laguna Seca once, there was an issue with timing, and Roger went with me to the officials. He tried to explain that so-and-so didn't pass so-and-so, and I said: "Roger, let me take care of it. I'll look at their numbers." He smiled and walked away. This is no bloviator. You don't question Roger Penske's success, because everything about Roger is real.

C/D: If you had to do it all over again, what would you change?

JS: Nothing. It was a wonderful time. —PETER MANSON

CAR AND DRIVER © Volume 61, Issue 7, (ISSN 0008-6002) is published 12 times a year by **Hearst Communications, Inc.**, 300 West 57th Street, New York, New York 10019 U.S.A. Frank A. Bennack, Jr., Executive Vice Chairman and Chief Executive Officer of the Board; Steven R. Swartz, President; Catherine A. Bostrom, Secretary. Hearst Magazines Division: David Carey, President; John A. Rohan, Jr., Senior Vice President, Finance. © 2015 by **Hearst Communications, Inc.** All rights reserved. **Car and Driver** is a registered trademark of **Hearst Communications, Inc.** Periodicals postage paid at N.Y., N.Y., and additional entry post offices. Canada Post International Publications mail product (Canadian distribution) sales agreement 40012499. Editorial and Advertising Offices: 300 West 57th Street, New York, New York 10019-5239 **SUBSCRIPTION PRICES** U.S. and possessions: \$13.00 for one year. Canada and all other countries: \$29.94 for one year. **SUBSCRIPTION SERVICES** *Car and Driver* will, upon receipt of a complete subscription order, undertake fulfillment of that order so as to provide the first copy for delivery by the Postal Service or alternate carrier within 4-6 weeks.

From time to time, we make our subscriber list available to companies that sell goods and services by mail that we believe would interest our readers. If you would rather not receive such offers via postal mail, please send your current mailing label or exact copy to Mail Preference Service, P.O. Box 37870, Boone, IA 50037. You can also visit <http://hearst.ed4.net/profile/login.cfm> to manage your preferences and opt out of receiving marketing offers by email.

For customer service, changes of address, and subscription orders, log on to service.caranddriver.com or write to Customer Service Dept., *Car and Driver*, P.O. Box 37870, Boone, IA 50037. *Car and Driver* is not responsible for unsolicited manuscripts or art. None will be returned unless accompanied by a self-addressed stamped envelope. Authorized periodicals postage by the Post Office Department, Ottawa, Canada, and for payment in cash. **POSTMASTER** Send all U.S.A. CFS. (See DMM 7074.2-5.) **NON-POSTAL AND MILITARY FACILITIES** send address corrections to *Car and Driver*, P.O. Box 37870, Boone, IA 50037. Printed in the U.S.A.

illustration by **MARTIN SATI**

Speeding Ticket
Limited
Guarantee!

Give the Gift of Ticket Protection

NEW

MAX³⁶⁰

Dual-antenna detection rapidly scans surrounding threats.
Experience ultimate intelligence by instantly knowing the direction of the source.



1

AutoLearn Technology

GPS location-based technology identifies and locks out false alerts as you drive

2

Extreme Range

Extreme range and all out performance for the ultimate driving experience

3

Defender™ Database

Real-time resource to alert drivers to speed cameras, red-light cameras, speed traps and other risks

4

ESCORT Live

ESCORT Live App leverages crowd-sourced alerts and ticket protection

ESCORT[®]

Receive 360° Coverage with our **Speeding Ticket Limited Guarantee*** when purchased factory direct. Call 800.588.4554 or visit EscortRadar.com for details!

*Certain terms, conditions and limitations may apply; see EscortRadar.com for details.

PERFECT HARMONY



20MM WERE SHAVED FROM THE WHEELBASE. THE ENGINE WAS MOUNTED 12.5MM LOWER. AND OVER 148 POUNDS WERE SHED. METICULOUS DETAIL WENT INTO BUILDING THE NEW MAZDA MX-5 MIATA. IN FACT, ONLY WHEN YOU'RE IN THE DRIVER'S SEAT CAN IT ACHIEVE ITS NEAR-PERFECT 50/50 WEIGHT DISTRIBUTION. AND IT'S NOT JUST THE MX-5 THAT RECEIVES THIS KIND OF ATTENTION; IT'S EVERY CAR WE BUILD. IN THE END, WE DO THIS FOR ONE SIMPLE REASON.

zoom-zoom

DRIVING MATTERS™

